

# The Age of Steel.

## HARDWARE EDITION

VOL. LXXIX.

ST. LOUIS, FEBRUARY 22, 1896.

NO. 8.



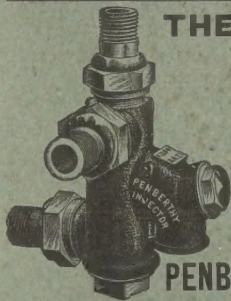
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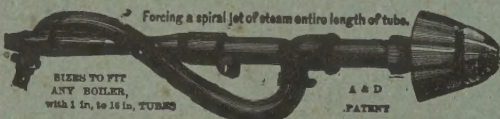
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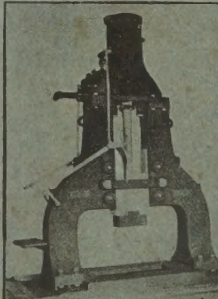
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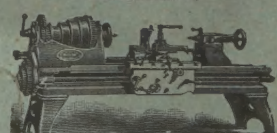
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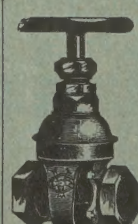
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# The Age of Steel.

HARDWARE EDITION: FOR HARDWARE DEALERS AND JOBBERS OF IRON, STEEL AND METALS.

VOL. LXXIX.

ST. LOUIS, FEBRUARY 22, 1896.

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## Six by Two Hardwood Flooring Machine.

We are pleased to present herewith an illustration of the new 6x2 hardwood flooring machine, manufactured by C. B. Rogers & Co., Norwich, Conn. Considerable difficulty has been found in working hardwood flooring to the perfect finish demanded by consumers, and this machine was specially designed to meet this want. It is built of extra weight, with powerful feed, and new and special hold-down appliances. The manufacturers maintain that there is no necessity of a flooring machine ever opening 6 inches thick, so they have built this one but 2½ inches, and are thus able to get shorter and stiffer head and roll posts, and do away with much of the intermediate and expansion gearing found on other flooring machines; and, by having it work but 6 inches wide they are able to make the whole machine narrower and, consequently, stronger, much less strain coming on gears and shafts.

By the use of the hand-wheel shown, one can

hold-down stock while the upper side is being dressed. This saves weighting the chip breaker, and it will be readily admitted that there is less friction in a nicely adjusted idle roll than in a heavily weighted chip breaker. Other new and powerful pressures and hold-downs have been applied between side heads.

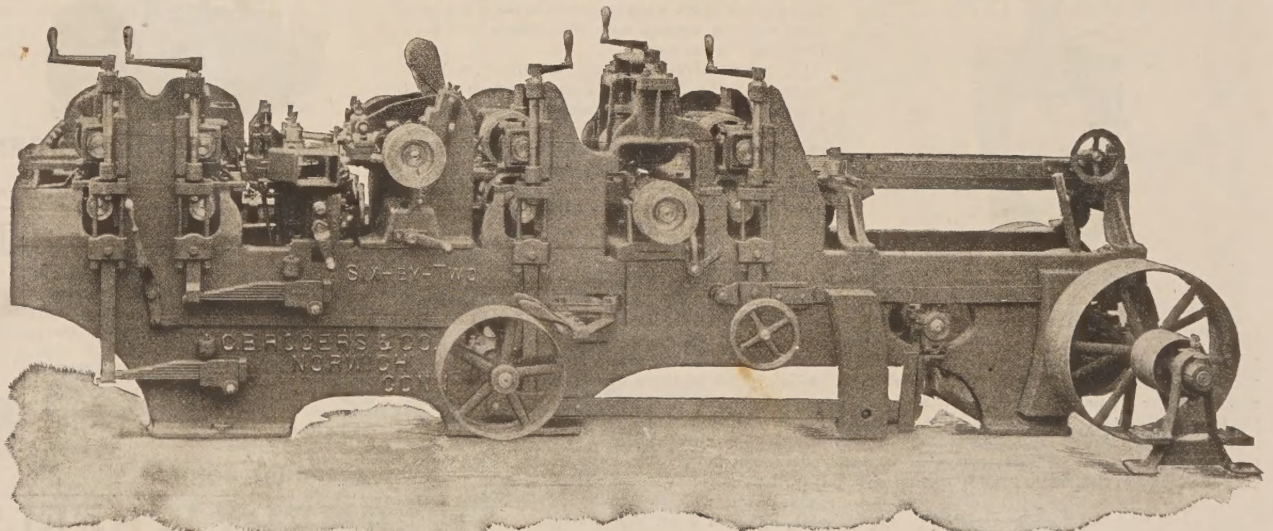
There are four feeding-out rolls. Dressed flooring is almost slippery enough to skate on, and it is asking too much of one pair of rolls to pull it out; so they provide two pair, and there is no stoppage of feed and consequently no "burns" on finished stock. Each feed roll is yoked and has an independent pressure. The feeding-out rolls have this pressure applied from springs, as the builders say they have ascertained that it is the best method where lumber is dressed and of an even thickness.

The cylinder bearings are extra large, and all cylinders are made from one solid piece of best crucible steel, forged and turned into shape. The manufacturers also claim that while other machines will work flooring at 35 to 45 feet per min-

company will build a stone power house, 20 by 30 feet in size, close to their pulp mill. The penstock, leading to the pulp mill, will be tapped, and a portion of the water diverted to run a 250 horse power James Leffel turbine, in which will be attached two 125 horse power generators. The head water on this turbine will be 125 feet. At the top of the cliff will be two electric motors, of 100 horse power each, attached to each of the paper machines; besides, there will be two motors of 5 horse power each, to furnish power for the small machinery about the mill.

## Graduates of Technical Schools.

What becomes of the graduates in our Technical Schools, and how far their studies have reflected their future, are questions of more than ordinary interest. To show a connection between the studies in the schools and their direct application in practical life is to secure a just claim for their importance and value. The Massachusetts Institute



SIX BY TWO HARDWOOD FLOORING MACHINE.

easily adjust the first bottom feed roll, and that part of the bed between feed roll and lower cylinder, to gauge the amount of cut to be taken by lower head. It is the same principle that is used on a buzz planer, and saves adjusting lower cylinder up or down. The lower head pulls out to the side, together with about four inches of bed plate, to set or line up knives by. It is instantly clamped fast by means of a wrench, without going to the other side of machine.

Of all the five-head machines in use, on maple flooring to-day, the builders have ascertained, by actual count, that over two-thirds have their final lower cylinder entirely removed, or else standing idle without a belt. This proves conclusively that only one lower head is required, and shows where to put it. There are two yoked, idle rolls moving up and down in ways. Over the end of each of these rolls is a spring of 1500 pounds resistance, giving a pressure of 6000 pounds to force every crook in stock down on bed plate. Directly before the top head chip breaker is another idle roll, working under stiff springs, to help the chip breaker

ute, this one will do superior work at 55 to 65 feet. Further particulars will be furnished on application.

## Electric Power Paper Mill.

The Cliff Paper Company, of Niagara Falls, are building a new power house, in which they will generate electricity for use in their paper mill. This paper company has a pulp mill, driven by two Leffel wheels, of 2500 horse power, at the water's edge below the falls, and a paper mill on the top of the high cliff, thus securing a double service from the water. This double use of water is quite an innovation, and has brought discredit upon the saying, that "The mill will never grind with the water that is passed." Now, this progressive company is about to take another step to practice economy, and it will adopt electricity, to succeed steam, to run the paper machines. When this proposed electric plant is installed, it will drive out three steam engines of over 200 horse power. Preparatory to the adoption of the electric current, this

of Technology has compiled some important data bearing on this subject. In the textile group of trades some twenty-six graduates are employed in their several lines of product. Railroad work absorbed twenty-one students. Nineteen went into the manufacture of general machinery; sixteen are consulting engineers; fourteen in electric work; forty-six in the manufacture of special machinery, and groups of ten to a dozen each have gone into steel and iron work, steam pumps, shipping and marine engines or related industries. These figures are interesting coming from such a high source.

The broad results are in favor of technical education, not only as elevating the standard of intelligence, but as directing the business future of its students, and deciding their choice of a trade. Aside from its practical value in enhancing the value of manufactured products by improving their quality, its infusing of brightened minds and trained hands into modern industrial life, is doing much not only to elevate the tone of labor, but to make its pursuit an honorable ambition.



## The Eureka Mole Trap.

The illustrations herewith pertain to the Eureka mole trap, manufactured and being placed on the market by the Atwater Manufacturing Company, of Southington, Conn.

In Fig. 1 the trap is shown set, the uplifted ground being previously pressed down the length of the

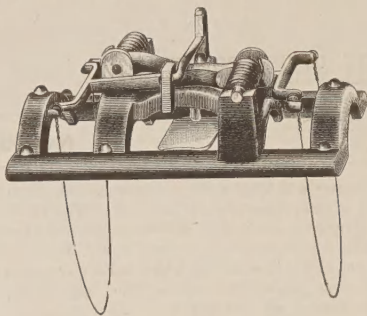


FIG. 1.

trap. The trap is placed lengthwise on the burrow, with the trap pan, or flat piece, at the center of the trap pressed firmly on the ground. The trowel, Fig. 2, has notches along the edges of the blade, around which one of the wires is placed, and the trowel is inserted into the burrow between the openings at one end of the frame. The trowel is withdrawn and the other wire similarly treated, leaving the wires

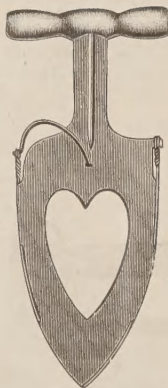


FIG. 2.

in the burrow. The arms are folded down as in Fig. 1, the trap set by a wire catching in a notch connected with trap pan, and the wires are attached to the arms of the trap. As the mole burrows under either end of the trap its head passes through one of the wires, and when its head comes in contact with the trap pan the pan is raised, springing the



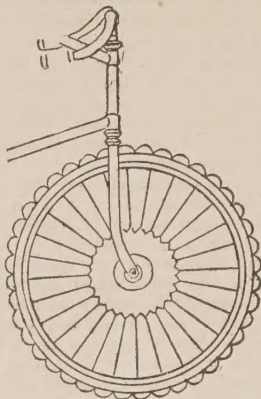
FIG. 3.

trap and drawing the wire tight under the animal, Fig. 3. The makers remark that the trap is practical, as it actually catches the mole, and that there is no getting away from it, that children and animals on the lawn cannot be harmed by it, and that the trap is easily set and operated. An instance is cited of one man catching eight moles from one hole with one of the traps.

## A Rubber Ball Tire.

Ball bearings on bicycles are to be followed by ball tires, if the plan now being tried by an inventor is successful. The idea is the latest in development of the many improvements that have been suggested on the pneumatic tire. Some years ago an Englishman brought out a tire which had the interior filled with hollow rubber balls but the plan did not work well. The new plan is to place the balls outside the rim, so that they will take the place of tubing.

The new tire is an arrangement of independently detachable hollow rubber balls, held in position by a channelled aluminum rim. The ball when in-



A RUBBER BALL TIRE.

flated will stand a pressure of twenty-five pounds to the square inch. The outer surface touches the ground, and as the wheel revolves three of the balls are always in contact with the surface and bear the weight of the rider.

"The great advantage of the ball tire," said the inventor "is that if one is punctured the buoyancy of the others will prevent the tire collapsing. One-third of the balls might be punctured without causing a bicyclist to end the trip, for the tire would still be buoyant enough to support his weight. When necessary a used-up ball may be taken out and a new one inserted with but a few minutes' loss of time.

## An Electric Locomotive.

The Baldwin Locomotive Works of Philadelphia, have shipped to the Westinghouse Electric Works, in Allegheny, the first electric locomotive ever built for a steam railroad. The Baldwin works made everything about this engine but the electric mechanism, which will be supplied by the Westinghouse company. The locomotive is the size of an ordinary box-car, about thirty feet long, and mounted upon two four-wheel trucks. Completed, it will weigh sixty tons. It is geared for 800 horse power, which will pull a loaded freight train forty miles an hour. By a single change of the gearing this engine can be run up to 1,600 horse power and can pull a train eighty miles an hour. This locomotive is intended for freight. The passenger ones will attain a far higher speed. The wheels are forty-two inches in diameter.

Only a space eight feet square is needed in the locomotive for the electric motor. One man will operate the locomotive by means of a controller similar to that on a common trolley car, only much larger and stronger. The locomotive is built to be operated by either overhead or underground wire. It carries no coal, fire-box, smoke-stack or water tank. In front is a powerful electric search-light for use at night to light the track. The cost of the new electric locomotive is about equal to that of a steam locomotive, or \$10,000.

The Central Oilings Stove Company, of Northampton, Mass., having works at Gardner, and Florence, Mass., also at Greenwich, Conn., and Jackson, Mich., which made an assignment in November, has been reorganized, and a new corporation with a similar name has purchased its property at Gardner, and will continue the business at that place. The new board of directors is as follows: Charles W. Conant, president; Albert P. Derby, Volney W. Howe, and others.

## THE HOOKER STEAM PUMP

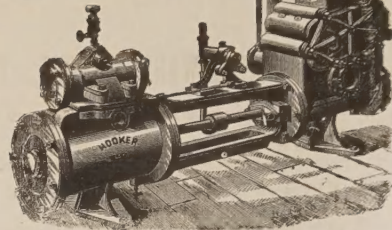
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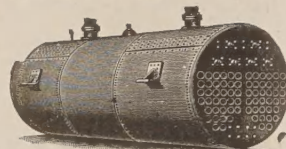
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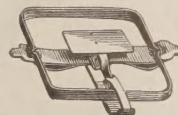
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## Some St. Louis Hardware Specialties.

We are pleased to present to our readers here-with illustrations of a few of the excellent specialties in the cutlery line manufactured by the Sperry Cutlery Mfg. Co., at 2315 North Broadway, St. Louis, Mo.

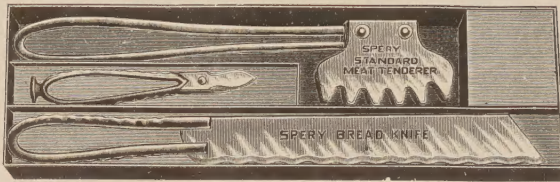


FIG. 1.

Fig. 1. represents the Sperry kitchen set, consisting of one of their wire-handled serrated knives, a Sperry can opener, with malleable handle, and a Sperry Standard meat tenderer, all finely nickel plated, and put up in a neat box. This set may be said to be a household necessity and sells very readily.



FIG. 2.

Fig. 2. shows the Sperry Queen bread knife, which is made of crucible cast steel, and highly finished. It is nickel plated, has a hardwood handle, is oil finished, and sells at a moderate price. In quality and finish it is superior to a great many knives of this kind now being put on the market, and is giving general satisfaction wherever used.



FIG. 3.

Fig. 3. gives a good idea of the Standard meat tenderer, made by the Sperry Company, and those of our readers who have been so unfortunate as to tire their molars and spoil their meals in the attempt to masticate a tough piece of beefsteak, will thank the Fates for this excellent little contrivance, which will render such an experience impossible by its use in the future. By the use of this tenderer the fibers

thousand pound casting, melting 9000 pounds of iron in fifty-three minutes, with sixty pounds of steam without crowding the blower. Our cupola is 44 inches in diameter. Yours truly,  
GREENCASTLE FOUNDRY & MACHINE CO.

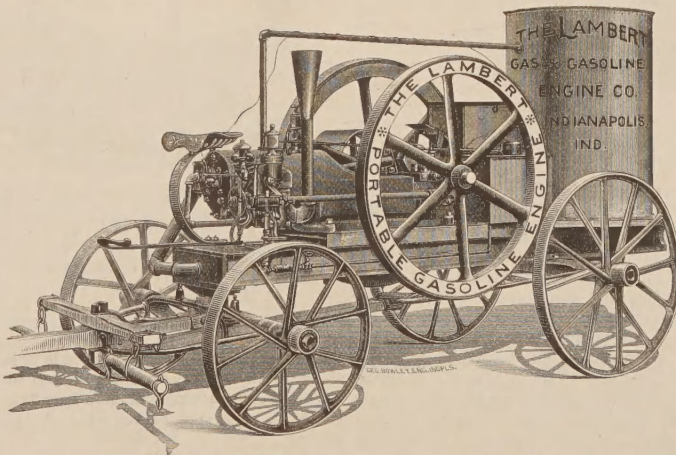
## Lambert Portable Gasoline Engines.

The accompanying illustration shows the Lambert

portable gasoline engine, properly mounted and fitted up with gasoline and cooling tanks, ready to run. It is built in sizes from 2 to 20 horse power by the Lambert Gas and Gasoline Engine Co., of Indianapolis, and is furnished with either an electric spark or a tube igniter, as desired by the purchaser.

The general advantages of the portable gasoline engine are pretty well understood, but it may not be amiss to briefly enumerate them in this connection as represented in the improved Lambert type, which is, in effect, the Lambert company's standard stationary engine mounted on wheels.

It is economical, costing only about one cent per hour per horse power. Can be set and run in a barn or close to hay or straw stacks with absolute safety, as there is no danger of fire or explosion. Is easily started and easily tended, all working parts being of simple construction and readily accessible. Is the only gas or gasoline engine built without the troublesome joint between cylinder and cooling chamber, and this style of constructing is fully cov-



LAMBERT PORTABLE GASOLINE ENGINES.

of the meat are cut through and through, while the juice is retained, which is not the case when a meat pounder is used. This tenderer cannot be surpassed, and will be appreciated by all housewives who know a good thing when it is shown to them.

The Sperry Company will gladly furnish circulars and further information in regard to these and other specialties upon application.

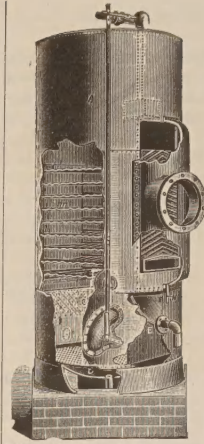
ered by the company's patents. Is substantially put up in all parts, not cheaply constructed, and all sales are made on the condition that the engine shall give satisfaction in accordance with representations.

Further information may be had by addressing James T. Mackay, Southwestern Agent, 615 North Second Street, St. Louis, Mo.

## Complimentary.

GREENCASTLE, IND., Feb. 14, 1896.

Gentlemen:—We purchased through N. O. Nelson Mfg. Co., St. Louis, Mo., one of your No. 8 blowers, and are running it with an 8 horse engine made by the James Leffel & Co., Springfield, O., and the blower gives us perfect satisfaction, running light and giving good pressure. We poured an eight



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Is the ONLY LIME EXTRACTING HEATER that will

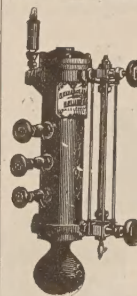
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REMOVING ALL IMPURITIES FROM THE WATER before it enters the boiler.

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Fuel Goes Further, at the  
Repairs are Less World's Fair  
and Life is Safer, Sent on Trial  
Subject to Satisfaction

### RELIANCE SAFETY WATER COLUMNS ARE USED.

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ALSO CUT TO LENGTHS FOR

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### Monarch Sash Chain

Is made by the same company.



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BROOKLYN BRIDGE IN THE PRE-  
CEDING MONTH AND THE NEAREST  
GETS A ROBERTSON-THOMPSON INDICATOR COMPLETE.  
PRICE, \$40. A GUESS CERTIFICATE IN EVERY BOX OF  
"EUREKA PACKING." GET A BOX AND TRY YOUR LUCK.  
THE WINNERS.—NOV., 8,615,236; DEC., 8,405,063; JAN.,  
8,800,000; FEB., 3,705,575; MCH., 3,912,692.  
**HINE & ROBERTSON CO.,**  
49 Cortlandt Street - - - NEW YORK



## Becker Vertical Spindle Milling Machine. No. 5.

The adaptability of a vertical spindle in a milling machine to a very great variety of work where a horizontal spindle is not available or not so convenient, is well known, especially by those who have tried it.

From the first vertical milling machine which Mr. John Becker brought out some five years ago, to the splendid machine which we here illustrate is a very great step, although the first type and those that have come between has become much used among machinists.

The spindle of the No. 5 is  $2\frac{1}{2}$  inches in diameter, with a 3 inch main bearing. It is powerfully back-gearred and runs in long bronze boxes and is provided with ball thrust bearings to prevent any play and remove friction.

The head has a vertical traverse of 7 inches, with automatic stop-gauge graduated to 1000th of an inch, which gives absolute accuracy to depth of cut.

The driving pulley is double back-gearred 5 to 1,

We illustrate in this connection a combined punch and squaring shear, specially designed for cutting heavy sheet iron from 8 to 14 gauge and lighter.

The machine is made in six sizes, with either 12, 15 or 18 inch throat punch, to punch a  $\frac{3}{8}$  hole in  $\frac{1}{4}$  inch iron, and with strengthening bolt, a  $\frac{1}{2}$  inch hole in  $\frac{3}{8}$  inch iron. The knives are 27, 33 and 39 inches long, so as to cut 24, 30, and 36 inch sheets of Nos. 10, 12 and 14 gauges crosswise in one cut. By the use of the squaring gauges this is accurately done without marking off, and for cutting sheets lengthwise the squaring gauges need not be removed from the table. As will be seen, the squaring gauge (S) is flattened in front and is set back from the blades so as to allow the sheet to be shifted for continuous cutting in trimming and slitting.

The quick-operating hold-down (H) holds the sheet securely on the table without removing the squaring gauges. The hold-down can be adjusted so as to be self-locking when down, and self-supporting when up, as shown in the cut.

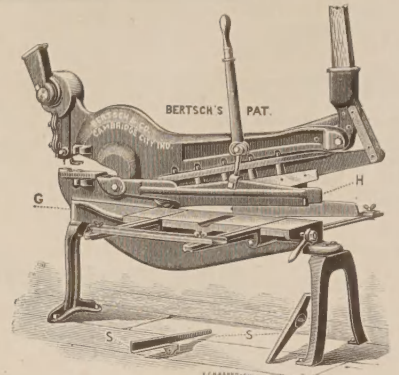
## Combined Punch and Shear.

(not shown) in front, to prevent springing, will cut two gauges heavier. Same has 12, 15, or 18 inch throat, so as to slit a 24, 30, or 36 inch sheet. It is placed on the rear side, in front, to admit of sheets being cut crosswise. It can also cut bar iron up to  $\frac{3}{8}$  x 3-inch or  $\frac{3}{8}$  inch round.

These shears are also made extra heavy, if desired, for cutting two or three gauges heavier than stated.

The left side of the main body of the casting, at the rear of the blades, is provided with a special adjustable parallel trimming gauge, in line with the blades, which properly guides the sheet in continuous cutting and insures the second cut to be in line with the first.

The machine is also especially adapted to cutting square or triangular holes in large sheets, by attaching a short blade on the front or outer end of the knife bar.

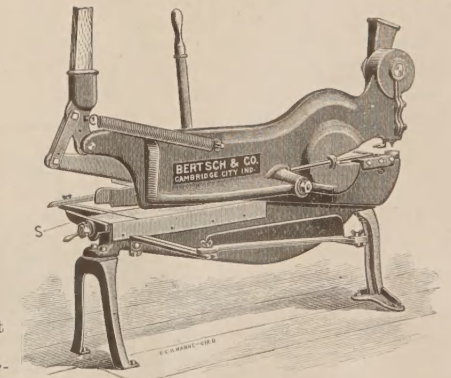


FRONT VIEW OF NO. 33 MACHINE.

taching a short blade on the front or outer end of the knife bar. This blade is from 4 to 8 inches long, and is attached with two bolts, and can be conveniently removed or set back on the knife bar, if desired, to cut holes in small sheets, but is preferably used at the end of the bar or knife seat for cutting holes in large sheets.

By punching a slot in the corner of the opening desired to be cut, the metal to be removed is more conveniently cut without marring the corners at the last cutting end of the blade.

The No. 27 machine, with the 4 inch blade, arranged as stated, will easily cut a hole 20 inches from the edge, or in the center of a 40 inch sheet, of No. 10 gauge.



BACK VIEW OF NO. 33 MACHINE.

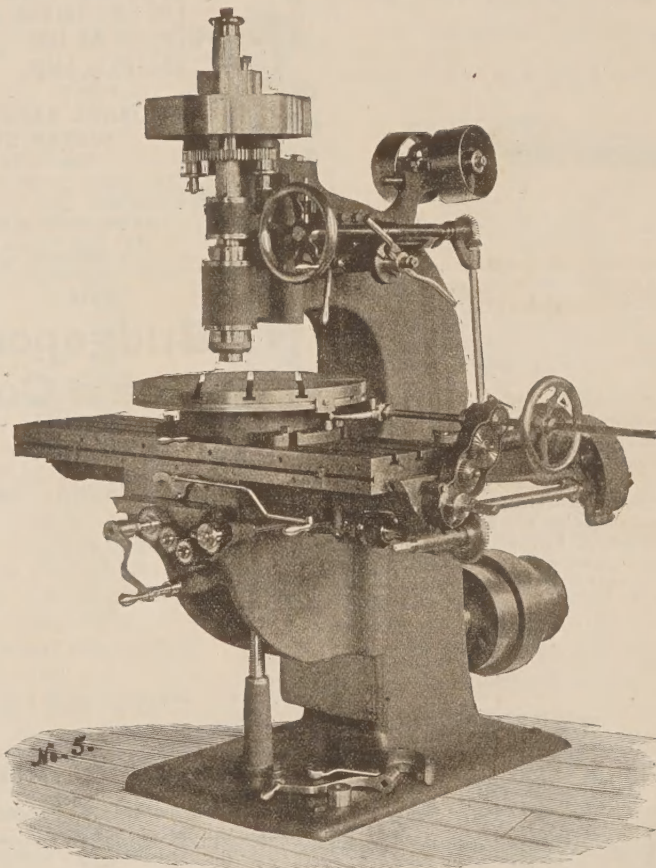
The No. 33 machine will cut a hole 27 inches from the edge, or in the center of a 54 inch sheet.

The No. 39 machine will cut a hole 33 inches from the edge, or in the center of a sheet 66 inches square.

Heavier machines with greater capacity are made to order. Special punches and dies for punching out corners are also furnished to order. For punching the corners of holes to be cut in large sheets, the machines are preferably made with extra deep throat punch.

The machine is preferably made with 15 or 18 inch throat punch, and is complete with front and back gauges, and three sets of dies and punches.

The punch is also provided with adjustable back gauge and adjustable side pin gauge (not shown),



BECKER VERTICAL SPINDLE MILLING MACHINE. No. 5.

and independently mounted to give perfect alignment.

The table, which has a surface of 48 x 13 inches, has an automatic screw feed in all directions, the longitudinal feed being 40 inches and the cross feed 13 inches. The table is fed by compound gears having six changes for each change of spindle feed.

The knee has a vertical adjustment of 18 inches. The greatest distance between main table and end of spindle is 18 inches and between rotary table and end of spindle  $15\frac{1}{2}$  inches.

The table of the rotary attachment is 22 inches diameter and swings 34 inches clear and has automatic feed in both directions with automatic stops.

The frame is extremely firm and rigid, the tool weighing complete about 4300 lbs. and occupying but 5 x 5 feet floor space. In the matters of workmanship and materials this machine is of the best.

Further particulars may be had by addressing John Becker Manufacturing Company, Fitchburg, Mass.

The squaring gauges are secured with one bolt and can be easily removed if desired.

The shear is provided with the usual set of squaring shear gauges, and can therefore be used for cutting metal accurately by the gauges, in every respect same as a squaring shear. With the compound lever (as shown), this shear will cut much heavier stock, and easier than is possible to cut on the old style treadle squaring shear, and is also more durable, being much stronger, has fewer wearing parts, and will do work much more rapidly and satisfactorily than is possible to do with the old style stock shears, or bench shears.

The shear with 27 inch blades will easily cut No. 12 gauge the full length of the blades; and by cutting one-half the length of the blades, it will cut No. 10. With 33 inch blades, it will cut No. 12 gauge the full length of the blades; and No. 10 by cutting 24 inches at a time. With 39 inch blades it will cut No. 12 gauge the full length of the blades and No. 10, 24 inches in one cut, or No. 8, 18 inches in one cut. With the strengthening yoke attached



the use of which enables the operator to punch holes of equal distance from the edge and equal distance apart without marking off, which is a very desirable feature for certain classes of work.

The bearing of the punch plunger is adjustable to compensate for any slight wear in the same. The punch plunger and eccentric shaft are made of steel with brass box for same, and the adjustable die seat is steel. Being small, it is well adapted to punching angle iron, flange iron, and the like. This machine, we may add, is especially designed for a general purpose tool, and being complete in every respect, is an invaluable tool for heavy sheet iron workers. The punch bearing, being adjustable, makes same very durable.

For further information and prices address Bertsch & Co., Cambridge City, Ind.

#### Zelnicker Ring and Chain Dogs.

The accompanying cuts show two styles Zelnicker ring and chain dogs, which are made by the Southern Log Cart and Supply Company, of Mobile, Ala. This company has been making these dogs for years and have won the trade of almost the entire territory contiguous to Mobile and now that they have put in improved machinery they are better prepared to take care of the trade further away from home. They make thirty-five styles of ring and chain dogs which are suited to the various kinds of wood, all of their dogs being made of double rolled refined iron and the welding being done by hand. This insures a perfect dog, and the eyes or holes in the dog being placed at the pro-

per distance from the head prevents them from shattering or splitting when driven into the log, and the iron not being brittle there is no chance of their breaking off, which is an important fact to mill men, as a piece of iron in a log will play serious havoc with a circular saw. Their delivered prices can be obtained on application and they will be pleased to send samples to prospective purchasers.

#### Cincinnati Notes.

Cincinnati, Feb. 19, 1896.

The Bickford Drill and Tool Co., of Cincinnati, are in a most prosperous condition. They have orders enough booked to keep them continually busy for four months and are working until eleven o'clock evenings to push their work along. As soon as the weather will permit they will commence work on their new shops which will be three stories high, and the main building will be 100x140. They have just placed on the market a 24" drill which is designed especially for the rapid accomplishment of work on bicycles, and also for the manufacture of machine parts where figures are used for accurate work or irregularly placed holes for drilling and seaming the same. A great feature of this machine is the arrangement of the countershaft and driving shaft, which are so situated that a number of the drill frames can be placed in a row and parallel with the line shaft, thus avoiding complicated arrangements of extra countershafting and usage of extra belts. By placing it in a row, mak-

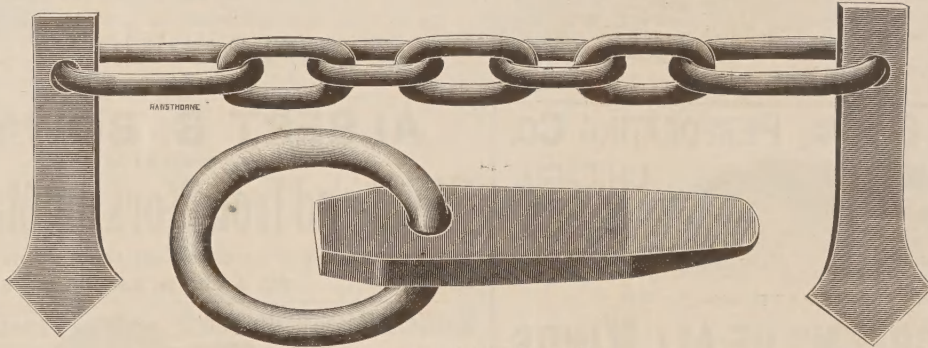
#### A Good Brazing Flux.

Probably for some kinds of work borax will never be improved upon for a flux, but for some other varieties of brazing borax does not completely fill the bill—as, for example, when brazing work which must be filed and cannot be ground. Then the borax will leave a very hard skin, which destroys many a file before it is fully removed. For this kind of work some mechanics like to use boracic acid putting it on with a brush or swab. The hard skin is thinner and comes off easier when the acid solution is used, but a writer in the "Tradesman" is of the opinion that the difference lies mostly in the fact that not so much of the flux is used when the solution is employed.

The usual way is to pound up a lot of lump borax in a lead melter's ladle or the hollow of a blacksmith's sow. Some of this (usually very coarse) powder is placed on the work with a bit of flat iron. Too much borax for the purpose is necessarily used in this manner, and the excess goes to make up the hard skin which "does for" the files. When the acid is used, the same effect is secured as when the solid borax is applied, but not one-tenth the amount is used, and that is applied just where it is needed.

If for any reason the manager insists upon solid borax being used, make that official procure a coffee mill (one of the old-fashioned cheap ones will answer perfectly) and have all the borax ground very fine. Then, a little of the dust powder can be rubbed or dusted on where the joint is to be made, and the braze made without having a lot of oxide and slag piled up around the work.

The same principle can be applied to soldering



ZELNICKER RING AND CHAIN DOGS.

In addition to manufacturing dogs they are also manufacturers of boom and rafting chain, "Tenacity" long link steel conveyor chain, every piece of which is guaranteed, and also a special guarantee that each and every link is guaranteed to be alike. In working over a sprocket this is a very important item. Among other goods that they manufacture are their yellow pine King lumbering tools, such as peaveys, cant hooks, skidding tongs, swamp hooks, jam hooks, cold shuts, lap links, etc. Drop them a line and get some information that will no doubt save you considerable money. It might appear to some people that Mobile is an out of the way point. In some respects it is, but for general trade they are centrally located, and by dealing with them you can get prompt shipments.

#### Railroad Building.

Railway Age: As to prospects for railway building in 1896 it is too early to give a detailed estimate, but it may be said that the outlook is better than it was a year ago. Our books show between 3000 and 4000 miles of proposed roads on which work was in progress in 1895 or for which contracts had been let, and many thousand miles more might be counted representing legitimate undertakings which sooner or later are likely to be carried out. If the general financial situation continues to improve, as now is the common expectation, railway building will receive a decided impulse. A study of the map will show that there is still room and will

ing it a multiple drill, the price is very much lessened. To show what a success this company have had with this drill, they sold fifty-four of them before they had been able to get out a circular descriptive of the same, to show their customers what they were buying. They simply took the company's word for it and got more than they bargained for at that. The Bickford people have some thirty-four or thirty-five different patterns of drills which they make, and it would seem that it would be a hard kind of a customer that couldn't make a selection from their stock.

The Sebastian Lathe Co. are showing marked evidence of prosperity. Next week they expect to move into their new machine shop over in Covington. Mr. Sebastian has built a very substantial brick building 65x90 just opposite the site of Houston, Stanwood & Gamble and will hereafter be "monarch of all he surveys."

Houston, Stanwood & Gamble are also keeping up their record for engine building. It would seem that they are getting their engines into almost every section of Missouri. This month so far has been a record breaker. They have already taken orders for more engines than they sold in January and February of last year—fifteen days against sixty—tells the story of better times all around for both the manufacturer and consumer.

Dietz, Shumacher & Co. recently shipped three car loads of lathes, &c., to Chicago, and report trade on their regular lathe work as fairly good, and exceptionally good on double spindle lathes, having received an order only yesterday from J. J. McCabe, New York City, for six. On account of the closeness of the money market they have deferred the commencement of work on their new building until later in the season.

R. K. LeBlond & Company are also having their full share of business, making about forty per month of small lathes for bicycle factories.

with rosin with equal advantage. Instead of having the rosin pounded up in a dish, grind that, too, in a coffee mill, and apply it by means of a little swab made out of a bit of cotton mosquito netting wound around the end of a bit of stick and tied with a thread. But a better way of using rosin for soldering is to play the liquid trick, the same as was done with the borax. This is easily done by dissolving the borax in alcohol. Wood alcohol, or the substance known as "alkaline," will answer as well as the pure alcohol, and will not cost as much, but the smell of the latter makes up for any shortcoming in the way of price.

The soldering flux thus made is to be applied with a swab in the same manner that acid is used. As the alcohol dries, which will be very quickly, the rosin will be deposited in a hard layer upon the surfaces to be soldered, and will not be easily thrown off by rain, wind, or any sudden jar, any of which will completely disperse the powdered rosin commonly used.

#### The Old Battle Fields

Of the South are attracting, and will continue to attract much attention. Once moistened by patriotic blood, and made historic by the heroic deeds of American manhood and chivalry, they will always remain as sacred ground. When you go South, it would be well to bear in mind that more than fifty famous battles occurred on and near to the line of the Nashville, Chattanooga & St. Louis Railway, forming almost a continuous battle ground from Nashville, Tenn., to Atlanta, Ga. The "Dixie Flyer" train, leaving Nashville at 7:30 a. m., daily, carrying through Pullman sleepers to Jacksonville, Fla., by Chattanooga, Atlanta, Macon, Lake City, gives daylight ride through the picturesque mountains and old battle fields of Tennessee and Georgia. Berths can be secured through from St. Louis and Chicago. Address R. C. Cowardin, Western Passenger Agent, 120 Laclede Building, St. Louis, Mo. tf



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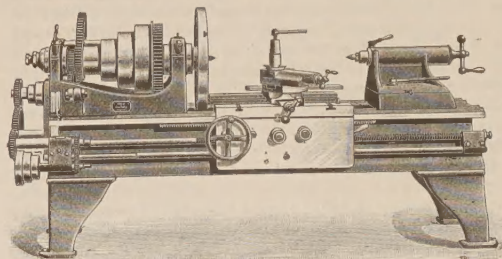
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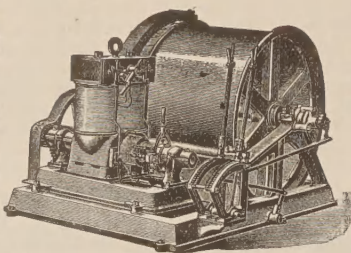
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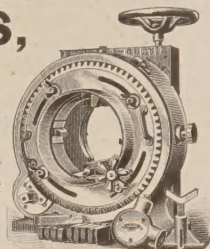
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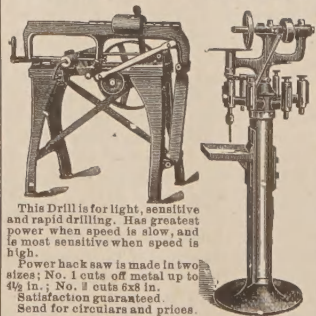
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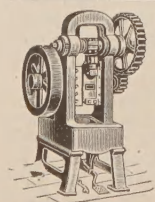
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 as second-class matter.

## THE RISE OF THE SUMMER STOVE.

The summer stove has long since ceased to be a novelty. It has made its way into public favor with good reasons for the same, and is likely to continue there on just the same claims. It may be heated with gas or oil, it may be costly, complicated, or otherwise, but wherever obtainable its service will secure its use. To this end, and with an appreciative knowledge of its popularity, the production of gas and oil stoves has become a great and growing industry. It represents heavy investments of capital, a host of ingenious devices, and continuous improvement both in artistic designs and practical utility. The producer of coal gas is in many of our cities extending the radius of supply, and the peddler of oil or gasoline is becoming as much in evidence as the milkman or the huckster. As the summer stove is in response to climatic conditions it is as directly so with the tastes and needs of modern times. It is an economizer of time and labor. It needs no coal shed and makes no smoke. It is independent of the chimney, and makes no contributions to the ash heap. It leaves the buck saw on the peg and involves no visits to the wood pile. It needs but a match and the turn of a screw to give it its meridian glow. It saves soap and towels, the penance of perspiration and a late breakfast. The house-wife escapes her daily parboiling and the family the usual strife as to who will light the fire. The stove that glowed like a forge and fried other things as well as steaks, and made an equator of the kitchen and a cauldron of a cottage, is now being replaced by its improved successor. Less dirt, less odor, less labor, less time, and less expense, are all in favor of the summer stove. It may insist on more care or intelligent use, and may have its risks when out of repair and not properly handled, but its economies and other advantages are so manifest, that its permanent place in household equipment is guaranteed till something better replaces it.

## THE BICYCLE INDUSTRY.

The popularity of the cycle has been so marked that its manufacture is rapidly becoming an enormous industry. What it already represents of invested capital, and well paid labor is simply immense. In this country and in others the same fact is everywhere in evidence. It is no doubt true that older industries have in some cases suffered, but there is no evading the fact that others have been greatly benefitted, and that in this new form of enterprise and industry, the labor, skill and business opportunities of the age have been greatly increased. As illustrating the magnitude of investment in this industry it is estimated that at a recent cycle show, the various companies exhibiting wheels represented a capital of \$90,000,000. In speaking of this a manufacturer is quoted as saying:

"The outside public has probably only a faint idea of the enormous capital necessary to carry on such an enterprise. One hears of almost unknown firms that intend to turn out, say, 50,000 or 100,000 bicycles in a year. It takes a tremendous plant to turn out a small part of that number. Now, a firm that intended to put from 1500 to 2000 bicycles on the mar-

ket of standard excellence would have to make a permanent investment of at least \$200,000 in machinery and factory, and before they get through with the matter they would find that a capital of \$400,000 or \$500,000 would be needed."

With the enterprise being shown in popularizing this method of locomotion in state and city exhibits or fairs, improvements in style and artistic embellishment, and the flow of demand that always follows every new direction of popular taste, the continued development of the new industry is practically assured. As the cycle becomes more closely identified with the interests and habits of the people, and has its representation in the amusements, recreations and festivals of the general public, as well as in its practical business, it will mark out for itself a wider circle of demand.

As a factor in foreign trade it is likely to make a good showing. American manufacturers have already established agencies in England, France, Italy and South America, and various types of the American wheel are rapidly finding favor in these and other countries. We bespeak for this industry both at home and abroad a prosperous future, the limit of which is not in sight.

## RAILWAY EARNINGS IN JANUARY.

That the tide of general business is surely but slowly rising is being evidenced by the satisfactory increase of earnings of railroads. The increase may not be large and in some instances not apparent at all, but the situation in its entirety is gradually rounding out into a larger circle of encouragement and prosperity. In a summary of present conditions by Bradstreet's, that well informed and accurate authority on all business statistics says: "January gross earnings may be classed as very satisfactory, showing as they do a continuance and accentuation of previous favorable conditions and the practical disappearance of many unfavorable features which have marked gross earnings reports for the past few months."

This broad and encouraging statement is sustained by the following table showing the earnings, monthly, for one year past, with comparisons for previous years:

	1895.	1894.	1893.
February .....	Dec. 2.3	Dec. 12.0	Dec. 3.4
March .....	Inc. .6	Dec. 13.2	Inc. 4.7
Three months .....	Dec. .5	Dec. 12.6	Inc. 2.4
April .....	Inc. 4.5	Dec. 14.3	Inc. 3.5
Four months .....	Inc. .9	Dec. 13.4	Inc. 2.0
May .....	Inc. 6.5	Dec. 17.5	Inc. 9.3
Five months .....	Inc. 2.5	Dec. 14.2	Inc. 4.0
June .....	Inc. 8.0	Dec. 22.0	Inc. 5.6
Six months .....	Inc. 2.5	Dec. 15.4	Inc. 4.5
July .....	Inc. 15.6	Dec. 19.0	Dec. 4.0
Seven months .....	Inc. 4.8	Dec. 19.0	Inc. 2.0
August .....	Inc. 1.6	Inc. .9	Dec. 13.0
Eight months .....	Inc. 4.2	Dec. 14.0	Inc. .8
September .....	Inc. 4.6	Dec. 5.3	Dec. 9.5
Nine months .....	Inc. 4.5	Dec. 13.0	Dec. 5.0
October .....	Inc. 6.8	Dec. 3.1	Dec. 2.1
Ten months .....	Inc. 4.7	Dec. 12.2	Inc. 1.0
November .....	Inc. 6.3	Dec. 1.4	Dec. 6.8
Eleven months .....	Inc. 4.8	Dec. 10.9	Dec. 1.5
December .....	Inc. 8.8	Dec. 1.1	Dec. 13.8
Twelve months .....	Inc. 5.2	Dec. 11.0	Dec. 2.1

	1896.	1895.	1894.
January .....	Inc. 11.3	Dec. .5	Dec. 12.0

All things considered, the period of the year, the slow movement of grain owing to low prices, and other depressing influences, the horoscope is not without its broadening lines and brighter outlook.

## THE RISKS OF CHEAPNESS.

There is no denying the fact that the prospect of getting an article for less than its cost value is intensely fascinating to the general public. Advertise a fire sale and the buzzard comes in crowds. Announce special bargains and the magnet draws as the loadstone does a needle. Placard the city walls with a notice of selling out at a loss, and the street cars are loaded with eager passengers to the Mecca of cheapness. It may be a subterfuge and a deliberate fraud, the cheap goods may be dear at any price, and the money spent thereon be practically thrown away, but the fish continue to follow the bait and the angler to ply his vocation. Men and women will waste shoe leather and time, and willingly sacrifice ten cents on car fare to save five cents in a purchase. It is done every day and everywhere, and in many instances to such a reckless extent as to seriously damage honest and reputable business. Now, while it is true that surplus, damaged or bankrupt stock have their legitimate claims on the public pocket, and have to be disposed of in

some way to escape total loss, it is no excuse or justification for its adoption where it is either fraudulent or unnecessary. It has too often been the ruin both of business and public morals. It interferes with the basis of values, and is a ravenous devourer of legitimate profits. It may be gratifying to petty or personal envy on the part of a merchant or dealer to undersell a competitor. It may keep the clerks busy and the procession moving. It may be an advertisement that travels where the bill poster never goes, and it may rake in dollars otherwise kept in a china mug or expected in another business cash box, but all this exuberance is too often as ephemeral and practically valueless as a rainbow would be if cut up into neckties. Men are in business for what they can save as well as for what they can sell. They cannot thrive on losses, nor can they pay their bills with what they throw away. The inevitable may be postponed by an elastic system of credits by which a two dollar trade can stave off a five dollar debt, but the end is sure. The milk stops when the cow is dry. Examples of this are familiar to all business men. They keep the insolvency mill grinding out its grist, and collection attorneys would have little to do if the curse and craze of cheapness was not so general. We admit its inducements and temptations, but no sane man can deny its dangers. To the man who sells as to the man who buys it has its fascinations. He loads his shelves with a surplus of stock that too often has to be dumped on the market at a sacrifice. Trade refuses to cross the threshold of his store without the temptation of a chromo or a prize. Patronage once sucked at this teat refuses any other kind of milk. The public are spoiled and business demoralized. It were better to sell less and make a profit than sell more and ask for an assignee. All staple and permanent business is built up on this line and when the mushroom is gone the old oak remains.

## A STRIKE WITH A MORAL.

The recent strike in the ship-building industries of the United Kingdom has made the circle of its life and disaster. Those responsible for its existence have now to face the results. The causes may not wholly rest on one side of the question, nor may blind obstinacy have been wanted in both parties. Suffice it to say that the strike itself devised as a hostile movement on one of the greatest industries of the country could not have been more timely in its assault, nor more venomous in its design. Labor troubles in less important industries, however fraught with hardship and bitterness, have but their limited circle of consequences. The fire scorches not a nation but a crowd, and the effects if deplorable are strictly circumscribed. When, however, the one industry of all others giving the United Kingdom pre-eminence is handicapped by industrial trouble, the frost of stagnation is a national calamity. It is impossible to shut our eyes to the fact that as a rule, and on one side of the question as on the other, the aggrieved party sees no further than the end of his nose, and in too many instances cuts off that member to spite the face to which it belonged. Trade wrongs both real and imaginary are apt to be treated in a narrow and bigoted spirit. They may be all they assume, or they may be a great deal less, but their relations to other conditions if overlooked or discounted remain the same. A broken valve may not mean a dead engine, or a cracked hub a ruined wheel, but in the relation to their dependent parts, they are likely to be more damaging than they seem. In the strike alluded to this fact has been emphasized. Trade has been driven more or less from the ship-building yards of Great Britain. Foreign orders have hesitated before putting their necks in a noose, and run the risk of delay through strikes. This is the logical result in such a trade. No man takes a horse to be shod when the smith is likely to be neglecting his forge in a sulk, and no man would risk his water supply on a hydrant that was as likely to be empty as full. There was a time when competition in ship building was tame and of no great significance. It is so no longer. That industry is reviving in all maritime nations. In Germany, Holland, and other continental countries, ship-building yards are multiplying, and they are prompt and ready to avail themselves of any labor dispute in Great Britain. The recent crisis divulged this fact, and the hint was as ominous as it was forcible, that its continuance simply meant the gradual trans-



fer of a large amount of British ship-building to other competing countries. The lesson is obvious, and the handwriting seen on the wall when the Medes and Persians are at the gates.

It may be that with such examples of folly broadly outlined on national history, that the evil of lockouts and strikes will be better understood and both capital and labor awake to the fact, that the cause of both is best served by the justice and good sense too often missing in industrial contentions.

Evidence is being constantly accumulated as to the displacing of horses by the bicycle. In some of the eastern cities where the riding academy has been a traditional and popular institution, its business is on the wane, and the misfortune attributed to the so-called bicycle craze. The horse dealer finds himself in many instances in the same predicament, and sees the silent prophet of his decay in every cycle spinning by his stable doors. The street railroad lines have also done much to hurry up the exodus of the equine. All this affects the trades and industries related to the use of the horse from the dealer to the harness-maker, and from the carriage-maker to the horse-shoer. It is the old story being re-told of the displacing of industries and their re-distribution. These changes are continuous, and while they necessarily involve temporary stagnation in affected lines, the general result is in human betterment.

The United States Export Association has recently been incorporated under the laws of the State of New York. This association has for its central object, the encouragement of the consumption of American products in other countries, by combining the influence of American producers, manufacturers, carriers, merchants and bankers and doing all things necessary to that end. The Information Bureau of this Association proposes to furnish free of charge all necessary information to both buyers and sellers engaged in foreign trade. There can be no question but that under wise directorship, and with a due amount of public appreciation, this association can render important service to American commerce, and fill up a long vacant niche in our public institutions. Temporary offices are located at 143 Chambers Street, New York, where the business of the association will be pushed as rapidly as possible.

As an instance of the longevity of first class marine engines and boilers when the best of material and workmanship were put into their building the White Star liner, *Germanic*, recently furnished an example worthy of note. Since 1875 this steamship has made her regular trips between Liverpool and New York. In that time 422 passages were made across the Atlantic, covering a distance of more than one and a half million statute miles. At the close of last year the vessel was returned to her builders for new boilers and engines of a different pattern. In this twenty years of hard service with its story of tempests and storms, the true and conscientious work of the engine and boiler maker came out of the struggle not for repairs, but to be replaced by later types of machinery.

American mechanical ingenuity has already covered the whole range of labor-saving appliances. Whatever it touches it improves, and nothing is either too large or too small for its attention. Among its later movements in the line of manufacture is the reported invention of a needle making machine, which it is claimed far surpasses all others in operation. The rate of production is so rapid and economical, that according to a press report, the new needle can be sold for fifty cents a thousand as against \$1.20 for English and 75 cents for those of German make. If this is as stated, a new industry will be added to those already helping to build up the prosperity of the American nation.

The condition of the tin-plate industry in Wales shows no signs of improvement. Strenuous efforts are being made to devise and popularize new uses for the hard-pressed product, and it is not unlikely that by this means the staving off of a grave disaster may be accomplished. Till that is done the situation will remain critical. It is also finding a keener edge in the symptoms of discontent among workmen, who whether ignorant of the real situation or not are intent on the fatal course of demanding

the maintenance of a wage-scale based on older and higher prices. It is not likely that in Wales or elsewhere manufacturers can for long run their plants at a loss.

The gasoline stove, in spite of the dangers involved in its ignorant or careless use, has a strong hold on popular demand. In economy, cleanliness, ease of handling, and speed of service, it has claims of its own; by the side of which the question of risk is generally but a secondary consideration. It is likely that the demand will be as active as ever during the present year, and the more so with the prospect in sight of reduced prices in gasoline.

### Steel as Affected by Variations of Temperature.

BY B. F. SPALDING.

Some years ago M. du Hamel in his *Arts et Metiers*, gave an account of the method of making plates for drawing wire, which was translated and published in England as valuable information, because during the Napoleonic wars, a French wire draw-plate was worth its weight in silver. This method, in brief, was to use a piece of iron two inches wide and one inch thick, and indent one side thickly and deeply with the flat peen of the hand hammer, making furrows that would tend to keep melted iron from flowing off. Pieces of broken cast iron pots were heated with charcoal and cooled, and this was repeated several times until the metal came to a certain condition, when they called it *Potin*. They put this *potin* on the rough side of the bar, and wrapped the whole up in several folds of coarse cloth dipped in a solution of clay and water, and put it in the fire. The cloth charred, but the clay baked, and encased the contents, until such a degree of heat was attained as sufficed to melt the *potin*, when it was withdrawn from the fire, if the iron had also arrived at a proper heat, and gently stroked with the hammer upon the *potin*, breaking the clay muffler, of course, but when the piece was returned to the fire, its place was supplied by dry, powdered clay, thrown on the piece. Thus protected, the heat was again raised until the *potin* fused, when it was again taken out and hammered gently, and this process was repeated until by amalgamation with the wrought iron, the cast iron had become malleable, and had in fact assumed the nature of steel, and the bar was then drawn out, with hammer and sledge, to twice its original length. The holes were then punched, hot, with punches varying slightly in size. They were not punched quite through, but were pierced cold, and ground out to the required sizes.

We may learn about steel from the behavior of cast iron, and this source has been sought after for information. Cast iron will harden, with greater or less facility, according to its composition. If it has much silicon it will not harden. Some iron, even if it is cast on a heavy chill, will not become hard. It is very annoying to send a chill to the foundry, to have a die cast on it that is wanted very hard—say to bend steel springs with at the drop hammer—and after waiting a few days, have a die come in that has been cast on the chill, but nevertheless is not at all hard. The next day, a piece comes from the foundry, which is intended for the bed of a machine and is wanted soft enough to work with cutting tools, and it is very hard. On inquiry it is found that the same mixture of iron is used, but owing to some difficulty among the coke burners, the last heat was melted with short time coke, and the fuel is responsible for its hardness. Again when the necessary conditions exist, iron cast on a chill is very hard. It is quite possible that a chemical change occurs in the substance.

At West, Carey & Moens wire mill, in New York, the draw-plates, used for drawing telegraph wire, were made entirely of cast iron. The mixture of iron suitable for the purpose was ascertained by experiment, and the plates were cast on pins, to chill the iron around the holes which the pins formed. These pins were tapered to a point, at an angle of about forty degrees, and were knocked out of the plates, after casting, as soon as the iron set, so that the chilling took place between the melting heat and the temperature of congelation; yet that chilling was enough to make the iron around the pins hard enough for wire drawing plates. After the holes had been ground out with oil and emery and a rapidly revolving lap or short piece of wire, until they were round and smooth and of the desired size,

the plates were ready for use; and it is difficult to conceive of any operation more wearing than the drawing of wire through the reducing plate.

The nature of the operation is such that we can hardly understand how any of the lubricating material can be interposed between the plate and the wire. They are in such close contact that the particles, which lay on the outer surface of the wire, crowd in upon those beneath, under the pressure of the die against them as the wire is drawn in, and this pressure must therefore exceed that which is necessary to force the particles of the wire into such intimate contact with each other as to change the entire interior structure. Notwithstanding this great pressure, however, the lubricating material makes its presence evident, by preventing the cold welding, which would otherwise occur, and which would either cause the wire to break, or the interior surface of the die around the hole to tear out. So much is the interior structure of wire changed by drawing, that it will not bear to be reduced in size by this process but a little, for it gets so hard that it requires re-annealing. Although it gains in strength to resist tensional stress as it gets hard, its resistance to drawing increases in a greater proportion. Wire drawing is dependent upon the flowability, viscosity or ductility of the metal, because the reduction of the wire is preceded by the flowing or moving of the particles of the metal upon each other, in a manner like to a fluid, while its coherence is sufficient to retain it in a solid form, when it is not subject to abnormal stress. It produces a hardening effect.

When we consider the effects of heat, in its relation to the cohesive attraction, we must remember that its whole tendency is to separate the particles of the matter, and drive them farther apart, until at a certain point, they have so far separated that the solid mass becomes fluid. If we call that a normal temperature for iron wire, in which the experiments of Fairbairn decided that no material variation occurred in its strength, say from sixty to three or four hundred degrees above zero, we are not surprised to learn that as the temperature falls below the ordinary, the cohesive attraction should grow greater, and as it rises above the ordinary, the cohesive attraction should grow less. It is no greater strain on our credulity to believe that at 320 degrees below zero, the same iron wire which supports 34 tons in a normal temperature, will have its cohesion so increased that it will support 62 tons, than it is to believe that at 800 degrees above zero, when the heated wire is about to become luminous, it will have so loosened its tenacity that it will scarcely support one-half of its normal burden. It is an instance of the effect produced upon metal by other causes than those which affect the elements in its constitution. Sir Benjamin Baker is authority for the statement that under these circumstances "The chemical constituents of iron and steel do not change, but the molecular arrangement and intercrystalline cohesion must change." It is the arrangement of the molecules in respect to position, and not in respect to composition, which changes, for the chemical constitution of the mass remains very nearly the same under these comparatively moderate variations of temperature.

Mr. William Metcalf and Prof. John W. Langley arrived at the conclusion that the sudden cooling of steel from the temperature of boiling water, to the ordinary temperature, produced a hardening effect as evidenced principally, by a change in its specific gravity. Caron found that after thirty hardenings from a red heat, the specific gravity diminished from 7,817 to 7,743, and when it was discovered that steel heated once to 212 degrees, and then cooled, had diminished in specific gravity from 7,816 to 7,790 it was at once recognized as an effect of hardening; the decrease being .026 in one hardening, as against .074 for the repeated process. Under these circumstances also, Sir Benjamin Baker's remark holds true: "The chemical constituents of steel do not change, but the molecular arrangement and intercrystalline cohesion must change."

The results of Prof. Dewar's investigations, by which it was ascertained that the tenacity, or tensile strength of iron wire was nearly doubled by cooling it to 320 degrees below zero, show by this increase of cohesion, as the other experiments showed by the decrease of specific gravity, that a hardening effect took place in the reduction of temperature from the normal to a point below the normal. It would hardly be affirmed in this case,



dealing with iron wire, that there is such a change in the molecular arrangement as there is in a piece of steel which is hardened at a red heat, for in the latter case, there is a chemical change in the molecules in consequence of the arrest of a part of the carbon in combination with the iron before it has time to escape from the union; while in the case of the wire there is simply a tightening of the bonds of union between the grains, according to the laws of cohesive attraction; they may be strengthened by some polarization of the molecules, which causes the attraction to act all in one direction.

But with certain facts before us, there is no occasion to theorize. The facts indicate plainly, that with every reduction of temperature, there is due a corresponding hardness, if the change is made with sufficient rapidity to insure this possible result; as Prof. Dewar did, by inserting the wire in atmospheric air which had been frozen to the consistency of a liquid. And this hardening is independent of any change in the chemical constitution of the mass, or of its molecules.

The converse of this proposition is probably true, that there is a corresponding softening, due to every reduction of temperature which is made so slowly as to allow the molecules to re-adjust themselves freely, and without tension; and this softening is also independent of any change in the chemical constitution of the mass, or of its molecules.

There has recently been expressed a quite common desire to know what curious change is going on month after month in hardened steel armor-piercing projectiles which brings them finally in many instances to such a condition that they burst with a disruptive explosion, and also what causes a sword to lose a part of the rigor of its temper with the lapse of time. The latter phenomenon has been well accounted for by W. Mattieu Williams, by proving that the temper of hardening, due simply to contraction, may be relaxed by a repetition of slight and slow variations of temperature, as for instance, raising the articles to the boiling heat of water, and suffering them to regain their normal temperature in the open air. The first mentioned phenomenon is well explained in Prof. Thurston's description of internal strains. He says: "Such changes often take effect in the production of internal stresses coming of internal strains consequent upon, for example, rapid cooling." And again: "Such internal strains often so weaken large, or badly shaped iron castings that they break without other external stress than such as comes of their change of temperature when lying in the sun." It is on the principle of the Prince Rupert drops, which are glass drops thrown into water while melted, and thus acquires such internal tension that any jar that disturbs their equipoise shatters them in dust.

It will be conceded that excessive internal strains may be added to the list of hardening effects which are not due to a chemical change in the material. The effect of fire upon metals appears to be something of the same nature as its effect upon clay; it throws it into a fever of dryness, from which it is sometimes as irrecoverable as a brick. But that effect is only produced by excessive or long continued heat. While the more moderate changes of temperature produce more moderate effect, it is clearly apparent that to every variation there is a certain effect due.

All of these things point to a method of relieving any strain which is not caused by a chemical change. From the nature of such strains they are amenable to relief by a process which will not affect the nature of the steel. A proper understanding of them may give us some conception of a steel which will be hard without being brittle, because if an alloy, or combination of iron with any other substance, can be formed which will be hard without being in a state of internal tension, a long step will be taken in the desired direction.

The facts indicate that the process of Mr. Williams of annealing, which consisted in slowly cooling the articles after immersion in boiling water, may be carried to a further extent, and that good results may be obtained by carrying the cooling to some degrees below zero, and then relieving the tension by allowing the articles to resume in a gradual manner, their normal temperature, and freely adjust their position.

The effects of heat upon the cast iron pot metal, which converted it into potin, and then into a steel high in carbon that it was not practically welda-

ble, except by extraordinary methods; and the effects of chilling upon the cast iron draw-plates used in the New York wire mills, were only two forms and examples of the effects of variations of temperature at the higher points; the increase in the tenacity of wire, in Prof. Dewar's experiments, exhibits the effect of variation at a very low range of temperature; and the experiments of Mr. Metcalf, Prof. Langley, and of Mr. Williams, afford an illustration of the effect of variations of temperature in a middle region. From all of these may be deduced the general principle, that a variation of temperature, in any range, may be made available for useful effects without changing the chemical nature of the steel.

#### Couplings for Rotating Pieces.

In machinery it frequently occurs that it is necessary to couple up two or more independent pieces so that they will work together smoothly and effectively and transmit the same or an increased power at the same or a diminished speed; for the speed, it must be remembered, varies inversely as the power transmitted, so that a certain initial force may be made to act with great speed, or with correspondingly diminished power.

We have already considered the positive connection by gearing, and the frictional connection of bands in the form of belting, acting between rotating bodies at considerable distances apart. We now take up a subject of coupling bodies adjacent to one another whose axes of rotation are either, 1st, identical or coincident; 2d, parallel and adjacent; 3rd, intersecting each other; 4th, neither parallel or intersecting, but adjacent to each other.

Special forms of coupling are particularly adapted to be used with each of these special arrangements of axes. We will take up each division and indicate one or more means for coupling such rotating shafts under the varying circumstances respectively.

In the first division, we have two shafts whose adjacent ends abut and whose axes are in the same straight line. The most simple form of coupling in this case is the flanged disc form, consisting of a collar keyed to the shaft and flared out into an annular ring, not projecting beyond the end of the shaft. The end of the adjacent shaft is provided with a similar flanged collar and the two faces are bolted together. Often the faces of the discs are formed with matching sectors, inter-locking with one another, and thus taking the shearing strain from the bolts.

Another simple form, is made by halving down the meeting ends of the shafts so that they will overlap for a distance about equal to their diameter, and then enclose the joint in a collar keyed, or otherwise secured to the shafts. A box encloses the collar—this is called Fairbairn's coupling.

While the first form is not quite so neat in appearance, yet it is preferred by American millwrights to Fairbairn's coupling, much used in England.

The second division of our subject relates to shafts which continue in a parallel line, and where we must bridge the abutting ends. We may employ Oldham's coupling which acts by sliding contact and consists of two discs mounted on the adjacent ends of the shafts, and each having a transverse groove through the diameter; two bars at right angles to each other, and forming a cross, are slidingly mounted in these diametrical grooves, and each bar of the cross will slide in and out of its corresponding groove and transmit the rotation from one shaft to the other. In order to strengthen the cross bars they are often formed on opposite sides of a thin disc interposed between the grooved discs on the shafts. The rotation of the shafts thus coupled will be regular and uniform in angular velocity at every point of all rotation.

Where light power is to be transmitted and safety is an element to be considered, we may employ frictional discs. In this case the shafts run by each other to a certain extent and each has a series of separated discs, the intervals in one set corresponding with the thickness of the discs in the opposite set, whereby they will intermesh and transmit rotation by their frictional resistance to sliding. This form is often used in lathes, and has the advantage that the power transmitted may be varied by adjusting the shafts toward and from each other.

Other forms may be used, such as the pin and the slot, consisting of a crank action of a pin upon a slotted crank borne by the respective shafts; a

drag link form consists of two cranks connected by a link whose length depends on the distance between the parallel axes; a frictional contact by a simple roller properly designed, the choice depending on the different circumstances and requirements of the connections. J. E. B.

#### Meeting of the Mining Engineers.

The Twenty-Fifth Annual Convention of the American Institute of Mining Engineers was held at the Monongahela House, Pittsburg, Pa., this week. The program in brief was that at the opening session Tuesday evening, Mr. Joseph D. Weeks, president of the Institute, should consider the claims made on behalf of the late William Kelley as the inventor of the Bessemer process, in his annual address. Wednesday morning and afternoon were to be taken up by a railroad excursion to Homestead, Duquesne and East Pittsburg, including a visit to the Carnegie industrial plants at the first two-named places and the Westinghouse works at East Pittsburg. In the evening another session of the Institute, and the reading of papers. Thursday morning and afternoon, further sessions and the reading and discussion of papers. Thursday evening the annual banquet, beginning at 7:30 o'clock. Friday an excursion embracing an inspection of the glass works at Jeannette, the steel works at Latrobe and the plate glass establishment at Ford City.

The executive committee which arranged all the details of the meeting consisted of President Joseph D. Weeks; Secretary George H. Clapp, and the chairmen of the different committees. These were E. M. Ferguson, committee on reception; Captain Alfred Hunt, committee on excursion; Julian Kennedy, committee on finance; James Gayley, committee on program, badges, etc.; William H. Rea, committee on banquet, and J. C. McDowell, committee on hotels and accommodations.

At the initial session Tuesday evening, Feb. 18th, there was a good representation of the membership from both the United States and Canada, and later arrivals increased the number of those in attendance at the convention. Among the 170 members present were the following:

Stuart Lindsley, Orange, N. J.  
E. G. Spilsbury, Trenton, N. J.  
William Kent, New York.  
William R. Webster, Philadelphia.  
Benjamin Talbot, Pencoed, Pa.  
H. B. C. Nitz, Baltimore.  
E. W. Parker, Washington.  
Henry D. Hibbard, High Bridge, N. J.  
Robert M. Thompson, New York.  
J. P. Holloway, New York.  
John Wilkes, Charlotte, N. C.  
William C. Brown, New York.  
Justice Cox, Jr., Philadelphia.  
Perceval Roberts, Sr., Philadelphia.  
W. C. Ralston, San Francisco.  
H. A. J. Wilkins, South Bethlehem, Pa.  
David T. Day, Washington.  
R. W. Raymond, Brooklyn.  
J. D. Smith, Syracuse, N. Y.  
Robert H. Richards, Boston.  
P. G. Shook, Nashville.  
W. C. Eustis, Boston.  
F. E. Bachman, Buffalo.  
W. B. Cogswell, Ypsilanti, N. Y.  
David Baker, Sparrows Point, Md.  
T. S. Russell, Toronto.  
Thomas Robins, Jr., New York.  
Robert A. Cook, New Brunswick, N. J.  
Samuel Peters, Portland, Me.  
Erskine Ramsey, Birmingham, Ala.  
H. M. Norris, Philadelphia.  
W. S. Hungerford, Jersey City.  
Robert W. Hunt, Chicago.  
N. Lillienberg, New York.  
William G. Neilson, Philadelphia.  
Walter Crafts, Columbus, O.  
Edward G. Stoiber, Silverton, Col.  
S. T. Sherffer, New Bethlehem, Pa.  
F. S. Pearson, New York.  
Henry M. Whitney, Boston.  
Luther A. Roby, Cleveland.  
W. R. Shilling, Chicago.  
Benedict Crowell, Cleveland.  
D. Townsend, Philadelphia.  
E. N. Trump, Syracuse, N. Y.  
H. K. Stanford, Chicago.  
J. W. Tyson, Jr., Baltimore.  
J. King McAnahan, Hollidaysburg, Pa.  
John Fulton, Johnstown, Pa.  
F. A. Emmerton, Cleveland.  
George A. Dean, Mingo Junction, O.  
S. W. Croxton, Cleveland.  
M. G. Moore, Johnstown.  
P. H. Conradson, St. Paul.  
William Hainsworth, Seattle.  
Charles McCrery, Dunbar, Pa.

President Weeks, after announcing that a formal address of welcome would be dispensed with, read



an exhaustive and highly interesting paper on the invention of the Bessemer process, claiming the credit of that important invention for Wm. Kelley, a Pittsburg. After setting forth the importance of the invention of the Bessemer process, which has done so much to build up Pittsburg's industries, and presenting the claim that Kelley in 1847, at least seven years before Bessemer discovered the process, conceived and successfully practiced the invention, Mr. Weeks proceeded to state the evidence in support of his claim. He said:

"At the Cheltenham meeting of the British Association in 1856, Mr. Bessemer read a paper on his invention, which aroused the most widespread interest and marked the beginning of an epoch in the history of steel. In some way the facts contained in this paper were brought to the attention of William Kelly, at that time operating the Suwanee furnace, near Eddyville, Kentucky.

"He at once recognized the process as one that he had invented some years before and had been experimenting with at his furnace and forge. He immediately applied for a patent, but Bessemer was ahead of him in the United States Patent Office, and had been granted a patent November 11, 1856. The claim of Kelly was so like that of Bessemer that an interference was at once declared and testimony taken in April, 1857, after due notice to Bessemer. The evidence showed conclusively that Kelly not only conceived this process, but practiced it at his forge near Eddyville as early as 1847, and from 1851 to 1857 at the Suwanee furnace, near the same place. I have carefully read the affidavits in support of his claim, some twenty-two in number, from persons to whom he explained his process, to whom he had shown drawings, who had made patterns and castings for his machinery, who had helped him in his experiments and work, who had ladled the molten metal into his converter or 'air boiling furnace,' as he termed it, who had tested the metal after it was made, and if any confidence can be put in human testimony under oath, Kelly invented and practiced this process as early as 1847.

"The question as to Kelly's priority of invention of the pneumatic process has twice been before the United States Patent Office for adjudication. In the matter of the interference between Bessemer's patents and Kelly's application, the Acting Commissioner of Patents states, under date of April 11th, 1857: 'It appears that by the concurrent testimony of numerous witnesses Kelly made his invention and showed it by drawings and experiments as early as 1847, and this testimony appears to be reliable in every respect.' The patent of Bessemer was sealed at London on the 11th of April, 1856, and bears date 11th October, 1855. Priority of invention in this case is awarded to said Kelly, and it is ordered that a patent be issued accordingly unless an appeal be taken within sixty days from this date.' No appeal was taken, and on the 13th of June, 1857, the patent was issued to Kelly. In 1871 this patent came up, under the patent law then existing, for extension. A mass of testimony was then taken, and after a careful hearing, Mr. Kelly's patent was extended.

"To sum up, while the mechanical appliances that made possible the rapid production of pneumatic steel were Bessemer's of London, and while the idea of using spiegelstein to remove the oxygen and to recarbonize the metal was Mushet's, of Cheltenham, the original idea of decarburization by blasts of air was William Kelly's, of Pittsburg."

The second session was held Wednesday night in the banquet hall of the Monongahela House, President Joseph D. Weeks presiding. Prof. R. H. Richards, of the Boston Institute of Technology, read an interesting paper on the subject, "Experiments in Sorting Quartz Before Sizing," followed with another paper entitled "Notes on Conveying Belts and Their Uses," by Thomas Robins, Jr. of New York. These two papers were quite generally discussed. Other papers were: "Notes on the Walrand-Legenis Steel-Casting Process," by H. L. Hollis, of Chicago; "The Embreeville Estate of Tennessee," by Guy R. Johnson, Embreeville, Tenn., and "The Magnetic Separation of Non-Magnetic Material," by H. A. J. Wilkens, of South Bethlehem, Pa.

This (Thursday) afternoon the annual report of the council will be made to the Institute followed by the annual business meeting and election of officers. It has been pretty definitely settled that E. G. Spillsbury, of Trenton, N. J., will be chosen as the next president of the Institute, and R. W. Raymond, of New York, the present secretary, will be re-elected.

The papers, other than those already named, which were scheduled for reading during the time of the convention are as follows:

The Accumulation of Amalgam on Copper Plates, by R. T. Bayliss, of Marysville, Mont.

The Ore-Deposits of the Australian Broken Hill Consols Mine, Broken Hill, New South Wales, by George Smith, Broken Hill, New South Wales.

Note on Carbon-Bricks in the Blast-Furnace, by R. W. Raymond, New York City.

Notes on the Handling of Slags and Mattes at Smelting-Works in the Western United States, by Wm. Braden, Helena, Mont.

The Cycle of the Plunger-Jig, by R. H. Richards, Boston, Mass.

The Effect of Vibration upon the Structure of Wrought-Iron (Continued Discussion).

The Hydraulic Elevator at the Chestatee Mines, Georgia, by W. R. Crandall, Dahlonega, Ga.

Standard Physical Tests for the Blast-Furnace, by Thomas D. West, Sharpsville, Pa.

The Effect of Titaniferous Iron-Ores added to Phosphoric Ores in the Blast-Furnace, by Auguste J. Rossi, New York City.

The Assay by Prospectors of Auriferous Ores and Gravels by Means of Amalgamation and the Blow-Pipe, by W. H. Merritt, Toronto, Canada.

Physics of Cast-Iron (Continued Discussion in part).

Engineers' Club of St. Louis.

431st Meeting.

February 19th, 1896.

The club was called to order at 8:30 p. m., by President Ockerson, at 1600 Lucas Place. Sixteen members and three visitors present. The minutes of the 430th meeting were read and approved. The executive committee reported the doings of its 208th and 209th meetings, approving the treasurer's accounts for 1895, and approving the application for membership of O. H. B. Turner.

He was balloted for and elected. The resignation of A. M. Lockett was announced.

On motion of Mr. Crosby the secretary was directed to request the Committee on Library to prepare rules to govern the use of periodicals and books outside of the club rooms.

Prof. J. H. Kinealy then addressed the club on the subject of testing pressure gauges to high pressures, explaining in detail the investigations and experiments which he had recently conducted. The pressures were beyond the reach of the ordinary mercury column and special apparatus was therefore necessary. The plan which he had developed consisted in measuring the reduction in volume of an air column which was maintained at constant temperature. The volume decreased exactly as the pressures increased. He had in this way measured pressures up to 675 pounds per square inch.

Messrs. Barth, Freeman, Flad, Ockerson, Crosby, Harrington and Prindle took part in the discussion.

It was thought that the increase of temperature due to compressing the air, the possible absorption of air by the water and the possible expansion of the tube itself under the increase of pressure might introduce errors. Prof. Kinealy thought, however, that they were not sufficiently large to vitiate the results.

Mr. Barth showed the Club some curious pieces of steam engine piston packing rings which had evidently gone through a severe experience.

Adjourned.

WILLIAM H. BRYAN,

Secretary.

## PERSONAL.

We learn from an exchange that Mr. A. Morrison, late roadmaster of the Lehigh Valley railroad, has accepted the position of mechanical engineer with Dilworth, Porter & Co., of Pittsburg, for the special purpose of pushing the Goldie tie-plate.

Harvey Woodward has resigned the position of superintendent of the Gracey Woodward furnaces, at Clarksville, Tenn., and James Shannon has been appointed his successor.

## Catalogues and Circulars.

The Twentieth Century Catalogue of Bicycles issued by the E. C. Meacham Arms Company, of St. Louis, Mo., is one of the most artistic specimens of the printer's handicraft ever gotten out by the trade. Each wheel is shown with all its parts in the exact colors they appear when put on the market, and we do not believe a purchaser would have any difficulty in picking out his favorite from this splendid assortment of bicycles. The book is a beauty, and no mistake, and the line of wheels shown can hardly be surpassed, including as they do the Chevalier, the Marchionness, Winchester, Oxford, Mystic, Gloriana, Magnet, Cadet, Climax and other excellent makes. The Meacham Company has spared no pains in the compilation of this elegant catalogue, and there is but little room to question their assertion that a more complete and elaborate assembly of wheels was never before offered by one house in the world.

On February 8th, Herb McCrea, "The Little Crimson Streak," mounted on a Syracuse Crimson Rim, broke the world's  $\frac{3}{4}$  mile record paced standing start, time 1:22 2-5, former record 1:24 1-5, while C. S. Wells broke the world's flying start paced record for the same distance, February 12th, time 1:18 flat.



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## A Fine Number.

The Youth's Companion of February 13th publishes an unusually valuable article for young men, by the Lord Chief Justice of England, on "The Bar as a Profession." Sound advice, taken from a long and varied experience, and wise encouragement are given to young and prospective lawyers. It is as readable as a story, yet will bear careful study. Of eloquence Lord Russell says: "The desirable thing is to have something to say; and as to the manner of saying it, Daniel Webster spoke truly in his celebrated oration in honor of John Adams when he said, 'Clearness, force and earnestness are the qualities which produce conviction.'" Regarding the necessary qualifications for law: "Love of the profession for its own sake, and physical health to endure its trials, clear headed common sense and ability to wait are the main considerations to be taken into account in determining a choice of the bar as a profession. If the youthful aspirant possesses these, success is, humanly speaking, certain. The lawyer must remember that while he is fighting for the interests of his client, there are greater interests even than these; the interests of truth and honor; and he must never forget, as Sir Alexander Cockburn well expressed it, that in the battle his weapon must always be the sword of the soldier, and never the dagger of the assassin."

For the next issue of The Companion, the Washington's Birthday Number, Justice Oliver Wendell Holmes, the able inheritor of a great name, has written an interesting supplement to Lord Russell's article, presenting the subject from an American point of view. Appended to the article are a brief rejoinder by Lord Russell and a final comment by Mr. Justice Holmes.

Each issue of The Companion contains one or more articles of exceptional value, written by the ablest men and women of the age.

Clover Leaf St. Louis-Indianapolis Line—Two Trains Daily.

Commencing Nov. 24th, the Clover Leaf will run through parlor cars and sleepers daily between St. Louis Union Station and Indianapolis Union Station.

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D. G. EDWARDS, G. P. A.,  
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## PATENTS NOTICE TO INVENTORS.

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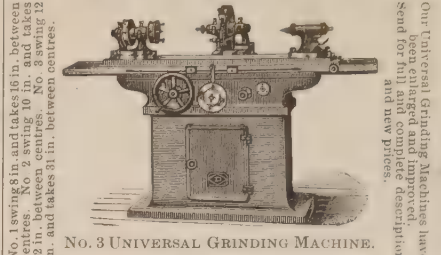
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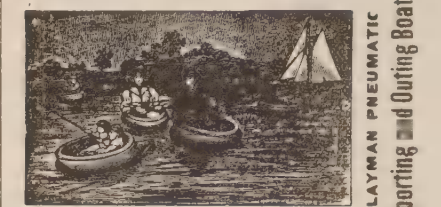
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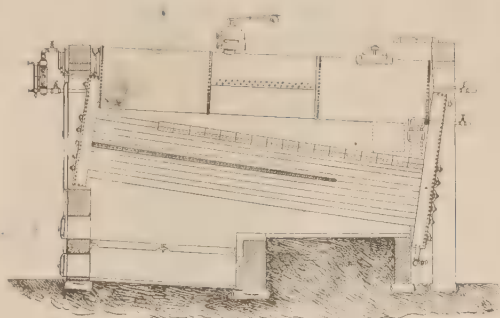
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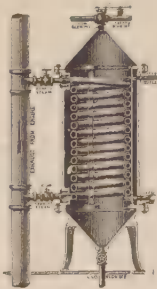
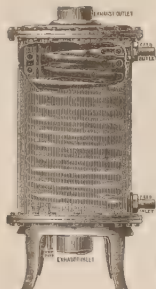
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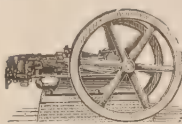
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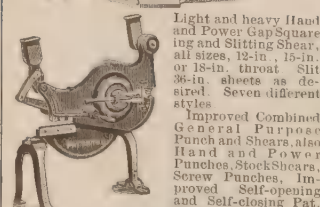
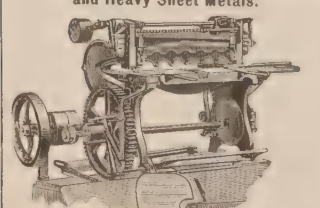
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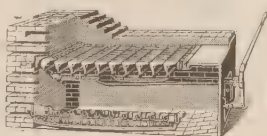
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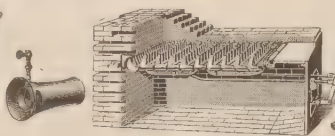
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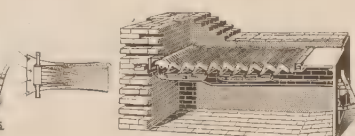
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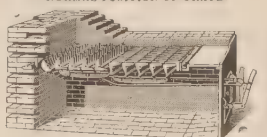
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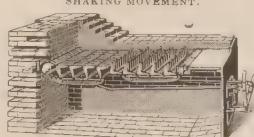


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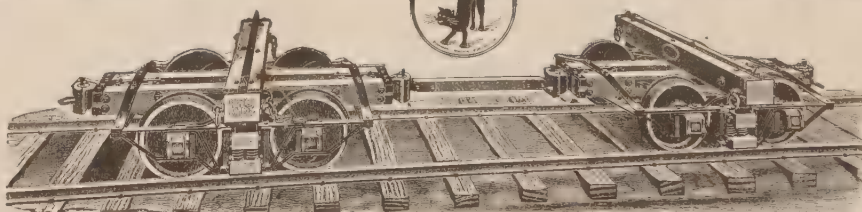
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LIVE ROLLS.



## ST. LOUIS AND VICINITY.

A special stockholders' meeting of the St. Louis Electric Light and Power Company has been called for the 15th of April next, for the purpose of voting on an increase of the capital stock of the company from \$75,000 to \$200,000. The call is signed by D. W. Guernsey, president, C. R. Scudder, secretary, and George D. Barnard, who constitute a majority of the directors.

W. D. Boyce & Co. note a slight lull in the various lines of machinery and supplies for which they are agents. Their recent orders have included a number from leading railways for packing of the United States Metallic Packing Company's brand. They lately completed the model power-house at Brentwood for the St. Louis & Kirkwood Electric Railway, on which they have been engaged for several months past.

The Western Foundry and Sash Weight Company are preparing to start up their sash weight foundry at the foot of Chippewa Street, owing to the recent large increase in sash weight orders. Their general castings foundry, on Miller Street, is also becoming busier. Demand for gray iron castings is reported to be much better, and they will shortly equip their Miller Street plant with cranes to handle the heavier lines of casting work.

The Cottage boiler, for which the Western Brass Manufacturing Company, 617 Walnut Street, are agents in this territory, is being introduced with a large measure of success. One advantage which it possesses is that hard or soft coal or wood of any kind can be used for fuel—a point which users are not slow to appreciate. It is giving entire satisfaction to those using it, and their endorsements are being freely and cordially forwarded to the company handling them here.

S. E. Flint, local representative of Russell & Co., has lately made the following sales: One 200-horse power, four-valve engine to the Empire Light and Power Company, and one 200-horse power heavy duty railroad engine to the Quincy Street Railway Company, Quincy, Ill.; one 125-horse power, four-valve engine to W. L. Elliott & Co.; one 300-horse power, heavy duty engine for railroad service, and a four-valve engine for electric lighting purposes to the Belleville (Ill.) Street Railway Company.

The Sucker State Drill Company at Belleville, Ill., are having a fine demand for their Sucker State grain drill, especially from Northwestern territory, a car load of them being shipped every three days, recent shipments including large quantities for points in Canada and Manitoba. Their circular wood saws, cider and wine presses are also finding ready sale throughout Northwestern and Western territory. The company are now employing sixty-four men, and expect to add to this number in a very short time.

The city of Union, Mo., William H. Bryan, consulting engineer, opened bids on Monday, 17th inst., for the construction of a complete water works plant on the gravity system. The contract for cast iron pipe and specials was awarded to the Howard-Harrison Iron Company, of Bessemer, Ala.; hydrants and valves to the Dietrich Supply Company, of St. Louis; machinery, pipe laying, reservoir, building, and aeration, to a local organization—Oscar Busch, A. J. Gorg, and Henry Kassman. The complete plant will cost about \$25,000. Work will be begun immediately and the plant completed by July 15, 1896.

Messrs. L. B. & J. D. Ripley, 725 Wainwright Building, have this week received a piece of 28-inch lap-welded wrought iron pipe, cut from a 20-foot length, made by the Pennsylvania Tube Works, of Pittsburgh, Pa., for whom they are sales agents. This is the largest lap-weld pipe in the world. The Pennsylvania Tube Works have made extensive improvements during the past year, and their output of finished material is now equal in quantity to that of any pipe mill in the country. They manufacture merchant pipe, black and galvanized, oil-well tubing, casing, line pipe, and drive pipe, electric railway poles, etc., and have an enviable reputation for superior quality and prompt shipment.

One of the heaviest machine tools in the works of the Granite City Steel Company, at Granite City, Ill., is an immense pair of shears, driven by direct-connected electric motors. The shears weigh between 90,000 and 95,000 pounds, with motor, and

were built expressly for this plant by the Frank Kneeland Machine Company, of Pittsburgh, Pa. The machine is designed to cut up steel billets 1½ inches square, and round bars of a section equal to that of railway axles. The knives on this machine are 18 inches long, 7 inches deep and 2½ inches thick. The bed, according to the description handed us, weighs 44,000 pounds, and its great weight enables the powerful shock due to heavy cutting to be absorbed by the inertia of its mass. The main pin or hinge about which the movable jaw rocks is a low phosphorus steel forging 8 inches in diameter, and is kept from turning in its bearings by a long feather or key. The lever, the movable blade of the tool is 14 inches thick where the knife is attached, this unusual thickness being provided to resist the heavy cross-strain produced by dull knives. The electric motor makes but 500 revolutions a minute at regular speed, and is controlled by a specially designed rheostat, so that the start may be made very slowly, an important matter on account of the great power required to start the heavy fly-wheel and the gearing by which the lever is moved.

## ELSEWHERE.

## Iron and Steel.

The Newport News (Va.) Iron and Brass Foundry has been purchased by Caskey Bros., of Philadelphia, Pa.

An order for 1500 tons of rails has been placed with the Pennsylvania Steel Company by the Cumberland Valley Railroad.

The Denver & Rio Grande Railroad Company have ordered 6000 tons of steel rails from the Colorado Fuel and Iron Company. The rails are to be delivered this spring.

The Whitely Malleable Iron Company, Muncie, Ind., are reported to be very busy in every department. The demand for car couplers which they manufacture is very heavy at present.

The Totten & Hogg Iron and Steel Foundry Company, Pittsburgh, are now at work on a pair of reversing engines and a special train of rolls, which they are building for the Ironton Structural Steel Company, of Duluth, Minn.

At the annual meeting of the Spearman Iron Company, of Sharpville, Pa., held recently, the following officers were elected: President, Joseph Forker; vice-presidents, John Phillips, Walter Pierce; general manager and treasurer, J. J. Spearman; secretary, M. H. Henderson.

"Iron Age." "The Potter & Hollis Foundry Company have removed their steel castings plant from East Chicago, Ind., to a much more convenient location at Fifty-ninth and Wallace Streets, Chicago. They retain their offices in The Rookery. During the short time in which they have been in the field they have built up an extensive business in the manufacture of small steel castings, for which the process used is specially suited."

American Manufacturer: "The stockholders of the J. P. Witherow Company, New Castle, met Tuesday, the 11th inst., and elected the following directors: H. M. Atwood, Isaac Reese, George Best, John Q. Denney, and James P. Witherow. Mr. Isaac Reese was afterward elected president, and Mr. John Nicholson, secretary. The report shows the company to be in excellent financial shape, with work enough ahead to assure another prosperous year."

Peacock's Iron Works, Selma, Ala., have favored us with a copy of their handsome calendar for 1896. The picture surmounting the date flaps is that of a little tot comparing his height with that of his favorite dog. The company have issued a new catalog devoted to the line of car wheels, axles, car irons, and cars of all description, which they manufacture, and will mail copies of same upon application. Mr. George Peacock, the proprietor, has been foremost in this line for the past thirty years, and has a fine reputation for the excellence of his product.

## Machinery.

A boiler works is to be erected at Parkersburg, W. Va., by J. M. Hughes, of Butler, Pa.

The Ohio Valley Pulley Works, at Maysville, Ky., has become an incorporated company, with a capital of \$50,000.

A plant for the manufacture of oil-well tools and

**CARPENTER STEEL COMPANY,**  
MANUFACTURERS OF  
**HIGH GRADE CRUCIBLE STEELS.**  
STANDARD, EXTRA, SPECIAL, DOUBLE SPECIAL, OR HARDENING.  
C. A. BLAKE, SALES AGENT.  
SUSSEX BANK BLDG. COMMERCE BLDG. ST. LOUIS, MO.

**BOILERS AND TANKS**  
OF EVERY DESCRIPTION.  
Pressing and Brine Tanks for Ice Machines erected in any part of the country.  
Also all kinds of Sheet Iron work. General repairing done promptly.  
**Jos. F. Wangler Boiler & Sheet Iron Works Co.,**  
ST. LOUIS, MISSOURI.

**ALLOYS.** BRASS, BRONZE AND ALUMINUM CASTINGS.  
Made in all Styles and for all Purposes by  
**AMERICAN BRASS AND MFG. CO.,**  
713 Lynch Street,  
ST. LOUIS, MO.

## PUSH YOUR PATENT.

Working out and Perfecting New Inventions a Specialty, and Good Patents Bought or Manufactured on Royalty. Designing and Constructing all kinds of Machinery. Models for all kinds of Mechanical Inventions. Brass and Wood Patterns. Write us for estimates. We give you the most prompt and efficient service in the Western Country.

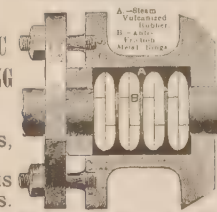
## Western Novelty &amp; Manufacturing Co.,

—SUCCESSORS TO—

**H. PERK MANUFACTURING CO.,**  
1502-1504 South Tenth Street, ST. LOUIS, MO.

**ELLIS MANUFACTURING CO.,**  
MANUFACTURERS OF

**RHODES' METALLIC PACKING** FOR PISTON RODS, VALVE STEMS and PUMPS.



THE BEST AND CHEAPEST PACKING ON THE MARKET.

GUARANTEED FOR TWO YEARS.

Office and Factory, 310 Locust St., ST. LOUIS. ROBBINS & WILLIAMS, AGENTS.

CHARLES NIEKAMP,  
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HENRY SPECK,  
Vice-Pres't and Sec.

**GLOBE FILE & IRON CO.,**

—DEALERS IN—

**HEAVY HARDWARE,****WAGON AND CARRIAGE BUILDERS' SUPPLIES.**

GRINDSTONES OF ALL SIZES.

RECURTING OF OLD FILES A SPECIALTY.

802 North Second Street,

**ST. LOUIS, MO.****Eclipse Shoe Stands and Lasts**

**REVERSIBLE AND COMMON SHOE LASTS, LAP LASTS, SHOE RESTS, SHOE HAMMERS, Etc., Etc.**

Patented May 1st, 1894.

FOR PRICES AND CIRCULARS ADDRESS

**JOHN C. KUPFERLE, St. Louis, Mo.**



supplies is to be built at Parkersburg, W. Va., by J. M. Hughes, of Butler, Pa.

The Seully Telling and Supply Company is about to be formed at Pittsburg by W. C. Wallace, A. M. Scott, Wm. J. Corneliuss Seully, Jr.

J. G. Tomplin & Sons, of Marion, Ind., manufacturers of steam pumps, have made an assignment of all their company and individual property. Assets reported sufficient to cover liabilities of \$20,000.

The Warren (R. L.) Manufacturing Company have ordered a vertical compound engine of 1800-horse power from the E. P. Allis Company, of Milwaukee, who were the builders of the old engine which was destroyed by fire in the early fall.

The electrical equipment of the extensive cotton mills of the Pelzer Manufacturing Company, one of the largest cotton goods manufacturing concerns in the South, is rapidly nearing completion. The motive power is derived from Victor Turbine water-wheels, driving three 750 kilowatt three-phase generators, wound for 2300 volts. The water-wheels turn at a speed of 161 revolutions per minute. The electricity generated at the power-house will be carried a distance of three and a half miles to Pelzer, where it will enter the mills, and drive the following motors: One 400-horse power synchronous motor, wound for high potential, and three multi-phase motors of varying capacities, from 5-horse power up to 110-horse power. The majority of these motors will be of the inverted type, suspended from the ceiling in the different rooms. They will receive the current at a low potential from step-down transformers placed in the substation at the mills. The mills will also be lighted from the same circuit. The system utilized in the operation of these mills is the three-phase system developed by the General Electric Company. By means of this system it is now generally conceded that long distance-power transmission may be most economically effected. It is the system in use at the Columbia Mills, at Columbia, S. C., and at the Ponemah Mills, at Taffville, Conn.

#### Hardware.

The Wood Stove Foundry, West Troy, N. Y., has resumed operations.

The Union Hardware Company, Torrington, Conn., will erect a new factory building.

Hamilton Herbert, saddle and wagon dealer, and W. P. Rose, Covington, Tenn., have consolidated under the style of the Covington Hardware Company.

Charles S. Tarbox has written a march complimentary to the merits of the United States bicycle, and the same has been issued by the Chicago Stamping Company.

The Electric and Gas Stove Company, Detroit, Mich., has been organized by Francis E. Pabst, Jeremiah Dwyer, Robert Hoyt, C. A. Duchaine, George H. Barbour, and Frank T. Dwyer. They will manufacture boilers for electricity, illuminating and natural gas, and also a new and improved range.

The Iyer Johnson Arms and Cycle Works, of Pittsburg, Mass., have received an order for 200 machines to be shipped to Christiania, Norway. This establishment has been doing business in Russia, Norway, and the Hawaiian Islands, and in Norway has sold a great many bicycles. Norway being a country that is noted for mechanics and their comprehensive grasp upon mechanical subjects, it is a matter of pride to the house above mentioned to be able to record so large an order for an American bicycle.

#### Miscellaneous.

The Boston Roofing Company, Boston, Mass., have been succeeded by Jas. T. Frederickson.

Duncan & Stewart, agricultural implement dealers, Franklin, Ind., have dissolved.

Darling, Brown & Sharpe, whose standard rules are known to every machinist, have brought out a line of tempered rules, which they guarantee equal in accuracy with their standard rules. The degree of accuracy of their standard rules is absolute, so that when they guarantee the tempered rules in this manner there can be no higher guarantee. These rules have the same variety of graduations as their standard rules, and adapted to all uses.

### CHARTERED AND PROJECTED.

#### ALABAMA.

A canning factory is to be started at Uniontown.

#### FLORIDA.

Plow works are to be established at Starke by V. M. Sapp.

#### ILLINOIS.

Baker-Stanton Pedal Company, Chicago; capital, \$50,000. Incorporators—J. F. and J. T. Stanton.

A new steel axe factory is projected at Peoria by E. J. Darst, George F. Emerson and John E. Kirk.

#### IOWA.

The Hooper Manufacturing Company, Dubuque; capital, \$25,000; to manufacture and sell all kinds of enameled metal wares, steam heating goods and supplies. Incorporators—C. N., J. A. and J. C. Hooper.

#### KANSAS.

King Mining Company, Galena; capital, \$50,000. Directors—George Tourtelot, J. D. Gray, O. D. Curt and A. S. Kent.

#### MARYLAND.

Montgomery Power Company, Montgomery County; capital, \$15,000; to furnish electric, hydraulic or steam power. Incorporators—Horace S. Cummings, of Washington, D. C.; R. L. Williams, of Richmond, Va., H. T. Douglas, of Baltimore, Md., and others.

United States Automatic Machine Company, Baltimore; capital, \$1000. Incorporators—Jos. Cromwell, Jr., and others.

#### MISSOURI.

Railway Supply Company, St. Louis; capital, \$20,000.

Norman Cycle Company, St. Louis; capital, \$25,000. Incorporators—Jos. Fenby, Chas. A. Magee, J. Stewart Walker and Jno. McCargo.

O. K. Disk Sharpening Company, Kansas City; capital, \$5000. Incorporators—John W. Simpson, Frank B. Ruton, Edgar Hubbard and others.

#### NEW YORK.

Brooklyn Glass and Manufacturing Company, Brooklyn; capital, \$15,000. Incorporators—Jno. C. Baker, of Great Neck, Wm. C. Roe, of Thomastown, and Geo. W. Green, of Brooklyn; to manufacture lamps, cutlery, etc.

The J. B. Carr Company, Troy; capital, \$30,000; to manufacture chains. Incorporators—Wm. Kemp, Mary G. Carr, and E. Hancock, of Troy, Wm. Kemp, Jr., Lansingburg, and F. B. Gilson, Whitehall.

The Fox Cutlery Company, New York; capital, \$8000. Incorporators—J. F. and Lizzie Kenkel, of Hoboken, N. J., Geo. Falkenhainer, and Laura Falkenhainer, of Dubuque, and Clara Grabhorn and Jno. H. Backus, of New York City.

A bicycle factory will very likely be started at Watertown.

Fred J. Titus & Co., of New York City, has been incorporated by Frederick J. Titus, of New York, and Chas. Stebbins and Walter Jellerson, of Brooklyn, to deal in bicycles in New York City. The capital stock is \$5000.

The Roy Manufacturing Company, of New York City, has been incorporated by A. X. Roy, M. Bouquet, of Brooklyn, and others, to deal in bicycles. It is capitalized at \$17,500.

#### NEBRASKA.

The McLaughlin Motor Brake and Coupler Company, Omaha; capital, \$1,000,000.

#### NEW JERSEY.

A large stove works is to be established at Dover.

#### OHIO.

The Ohio Bicycle Manufacturing Company was recently incorporated. The factory will be located at Marion. The incorporators are B. F. Schultz, A. C. Edmondson, E. Huber, H. R. Boland and Chas. Kauffman.

E. L. Heer Bicycle Company, Columbus; capital, \$15,000. Incorporators—Geo. A. Trout, H. B. F. H., E. L. and B. D. R. Heer.

Cleveland Wheel and Foundry Company, Cleveland; capital, \$80,000. Incorporators—Thos. Maher, Terrence Dalton, Jos. A. Stone, C. A. Brayton and T. H. Graham.

#### TENNESSEE.

Water works are to be put in at Clinton. A telephone system is talked of at Sweetwater.

## SWIFT SIGHT-FEED LUBRICATORS

Are adopted by over 300 Engine and Steam Pump Builders, and are endorsed by 125,000 Users. They have no glass tubes, and will feed any oil, no matter how heavy or how cold the weather.

**ASK YOUR DEALER TO SHOW YOU ONE.**

#### SOUTHWESTERN AGENCIES:

Detrick Supply Co., St. Louis, Mo.  
Moore & Hanley Hardware Co., Birmingham, Ala.  
The Fairbanks Co., New Orleans, La.  
United States Supply Co., Omaha, Neb.  
Ahrens & Ott Mfg. Co., Louisville, Ky.  
A. A. Bailey, Los Angeles, Cal.  
Brown & King Supply Co., Atlanta, Ga.  
J. S. Schofield's Sons & Co., Macon, Ga.  
U. S. Water and Steam Supply Co., Kansas City, Mo.  
Davenport Steam Heating Co., Davenport, Ia.

## CLIMAX BOILER OIL. BOILER OIL FEEDER

Absolutely Prevents and Removes Scale in Boilers.

**JAMES W. DAILEY, Sole Agent,**  
319 Bourse Bldg., PHILADELPHIA, PA.

#### AGENTS WANTED!

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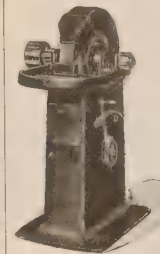
Machinery and Boiler Makers' Castings  
Wrought Iron Tanks, Etc.

**BOILER FRONTS A SPECIALTY**

**The Dickerman Emery Wheel & Machine Co.,**  
BRIDGEPORT, CONN.

#### MANUFACTURERS OF

**Emery Wheel  
Machinery,  
Polishing and Buffing  
Machinery.**



20-INCH TOOL GRINDER.  
Pat. applied for.

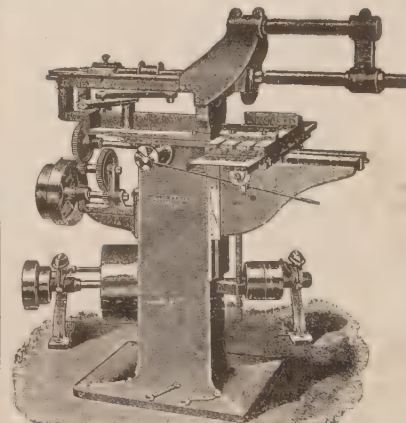
Tool Grinder Water Supply  
entirely inside of base.  
No pumps or piping.  
Simple, effective and always ready.

**JOHN COLES & CO., NAILS**  
MANUFACTURERS' AGENTS.  
—LALEDE BUILDING.—  
**ST. LOUIS, MO. WIRE IRON.**

**WOODWARD & ROGERS**  
HARTFORD, CONN.

**SURFACE GRINDERS**

For grinding dies and hardened parts of machinery  
Grinds from 8 in. wide 18 in. long to 14 in. wide to 32 in. long

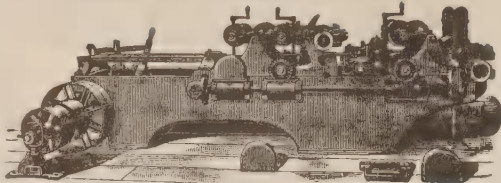


Sensitive drills from 1 spindle to 8 spindle.  
Tapping Machines, Cutter Grinders and Special Machinery

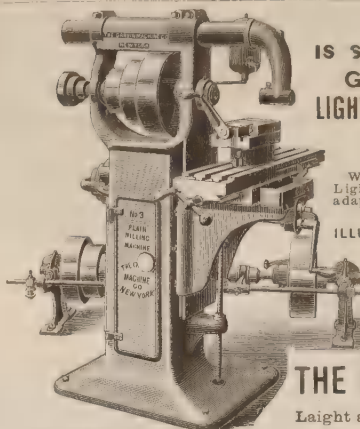


**GLEN COVE MACHINE CO., LIMITED.**

MANUFACTURERS OF IMPROVED

**PLANING MILL MACHINERY**FLOORING, MOULDING, SURFACING,  
SIZING AND TIMBER MACHINES.

SCREW FEED PLANING AND MATCHING

Office, No. 50 BROADWAY, New York City.  
Works, 11 to 13 CLAY ST., BROOKLYN, N. Y.

NO. 13 MILLING MACHINE.

**THIS MACHINE****IS SPECIALLY ADAPTED TO  
GENERAL MILLING,  
LIGHT MANUFACTURING, JOBBING  
—AND—  
TOOL WORK.**We have several other sizes and styles,  
Lighter and Heavier, Plain and Universal;  
adapted to every requirement.

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ILLUSTRATED CATALOGUE, PHOTOS &amp; PRICES.

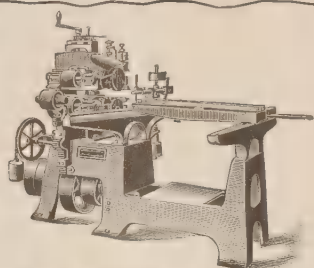
**MACHINERY**

OF ALL KINDS.

New and Second Hand  
ALWAYS IN STOCK.**THE GARVIN MACHINE CO.,**

Laight and Canal Sts., NEW YORK.

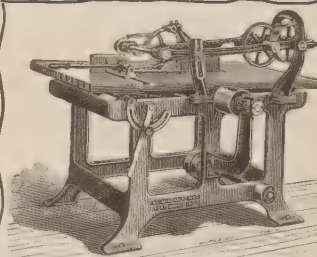
51 N. 7th St., PHILADELPHIA, PA.



NO. 2 TENONER, WITH COPE.

A very heavy Machine with frame cast in one piece;  
extra long table ways and extra long cope belts;  
All modern adjustments. Weighs 1,600  
pounds. We also build a lighter Machine  
for sash and furniture work.IT COSTS ONLY **1 CENT** TO INFORM YOURSELF

OF THE NEW AND IMPROVED

**WOOD TOOLS . .****WE OFFER,**And to get our 128 page Catalogue, which will  
interest you immensely.**INDIANA MACHINE WORKS,**  
**FORT WAYNE, IND.**

SELF-FEED RIP SAW.

With either wood or iron table. Frame is cast in  
one piece, and table raises square, always  
presenting a level surface.The citizens of Martin are discussing the water  
works question.The Citizens Electric Railway Company, are to  
build a power plant at Knoxville.

TEXAS.

A system of water works is in contemplation at  
Llano; John C. Oatman will furnish particulars.A telephone system is to be established at Brown-  
wood.

WASHINGTON.

Puget Sound Iron and Steel Works, Tacoma; capital,  
\$30,000. Incorporators—Jno. L. Roberts and A.  
C. Marconlier.

WISCONSIN.

Cream City Cycle Company, Milwaukee; capital,  
\$10,000. Incorporators—Ira D. and J. E. Lundy and  
Willis E. Acker.**St. Louis Cycle Show.**

The second annual cycle show held under the  
auspices of the Associated Cycling Clubs of this  
city, opened at the Exposition building, Thursday  
afternoon at two o'clock to continue three days,  
closing Saturday evening. When the doors were  
first opened the public was introduced to a lot of  
semi-completed exhibits, despite the great care and  
precaution on the part of the management to avoid  
such a beginning. It seems no matter what time is  
set in which to complete arrangements or how  
much effort is put forth to get everything in readi-  
ness, some one is bound to be found lagging behind.  
At any rate, it was so at the opening of the cycle  
show Thursday afternoon. The sound of saw and  
hammer was still to be heard. Here and there  
throughout the crowd were to be seen men hurrying  
with wheels or some part of the fixtures that go  
to make up the complete displays.

However, before nightfall all the finishing touches  
had been put on and the show took on a definite  
form. The main portion of the displays is located  
in the parquet circle of the Grand Music Hall. A  
platform built over the seats and elaborate decorations  
adorn the stage and interior part of the hall.  
Bunting and banners and flags interspersed with the  
curious and brilliant effects made possible by elec-  
tricity embellish the show booths in a way that  
gives the hall the appearance of being the scene of

a celebration of some great anniversary rather than  
a cycle show.

Anyone who is not convinced that the bicycle has  
come to stay ought to attend the show. The wild-  
est enthusiast among wheelmen did not dream such  
an event possible a brief decade ago. Following up  
this vein of thought one finds much food for reflection.  
The marvelous advancement now going on  
in the bicycle industry is a good exponent of what  
achievements are being worked out in other lines.  
It is worth anyone's while to study the near ap-  
proach to perfection so noticeable in the modern  
bicycle. At the show every variety of machine is  
to be found. The sextuplet, the quintuplet, the quads,  
triplets, tandem carriers and other special wheels  
are there in almost endless profusion. There are  
some eighty odd exhibits and allowing only ten  
machines for each we would have a total aggregat-  
ing more than 800 wheels; and inasmuch as the dis-  
plays in all probability average more than ten ma-  
chines, it would not be missing the truth far to say  
about 1,000 bicycles are on exhibition, representing  
in the neighborhood of 350 styles.

Everything new in the way of bicycle sundries and  
the very latest improvements in wheels are shown.  
A number of carrier tricycles are on exhibi-  
tion, together with a trolley device to assist begin-  
ners in learning to ride. Then there are improved  
gears made to increase the speed without requiring  
any more power. It is needless to say that the per-  
fection of these various devices as applied to bicy-  
cles must in the near future exert a wonderful influ-  
ence upon bringing the products of other branches  
of manufacture nearer perfection. The benefits ac-  
cruing to civilization through the improvement of  
mechanical appliances and more robust people, as  
well as in other particulars, is very plain to the  
average observer. All that tends to lift civiliza-  
tion towards a higher plane finds a strong support  
in the bicycle, and nowhere is this more apparent  
than at the cycle show.

**NOTES.**

The A. F. Shapleigh Hardware Company occupies  
spaces No. 37 and 38, and shows an attractive line  
of machines, comprising the celebrated Syracuse  
crimson rim wheels and the Empire and Rugby  
line. The display was especially attractive at

night when the brilliant effect of the multi-colored  
lights could be seen at their best.

The Simmons Hardware Company have an elabo-  
rate display showing the Iver, Eagle and Johnston  
wheels, together with a great variety of saddles,  
pedals and tandems.

The St. Louis Cycle Company have an exhibit of  
bicycles that should be seen by all attending the  
show—wheels, souvenirs and printed matter are  
very attractive and get the attention of the crowd.

E. C. Meacham Arms Company have on exhibi-  
tion an unusually large number of wheels, bicycle  
sundries and novelties. Their display is located in  
the center of the parquet circle near the front,  
which is one of the most desirable locations, and is  
always thronged about with devotees of the wheel.

The N. O. Nelson Manufacturing Company ex-  
hibit their Leclair line of machines, which is a  
very popular line of wheels. A portion of the  
name "Leclair" is worked in electric bulbs and  
presents a novel appearance.

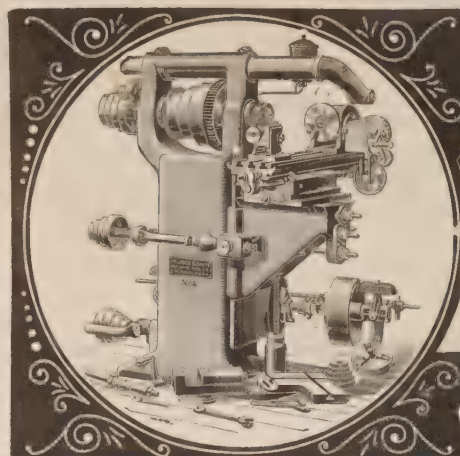
The Boston Woven Hose and Rubber Company  
display their well-known line of tires, their space  
being one of the most artistically decorated in the  
hall.

Other exhibitors having noteworthy displays are:  
Baumann Cycle Company, C. L. Carter &  
Company, T. B. Boyd & Company, Parlin  
& Orendorff Company, Puncture Proof Tire  
Company, C. H. Fargo & Co., American Dun-  
lap Tire Company, New York Tire Company,  
Hitching Cycle Company, Crawford Manufacturing  
Company, Van Nort Bros., J. B. Sickles Saddlery  
Company, International Wheel Company, Meyer-  
Bannerman Saddlery Company, J. R. Hinton Sad-  
dlery Company, Tidd-Rugg Cycle Company, Knight  
Cycle Company, Pape & Weber Carriage Company,  
Forest Park Cycle Company, Palmer Pneumatic  
Tire Company, A. H. Blackman & Co., S. M.  
Landis Company, Canfield & Sachtleben, Eugene  
Arnstein, C. & W. McClean, Hynson Hardware  
Company, Geo. K. Oyler Carriage Company.

The show will close Saturday evening at 10  
o'clock.

Bicycles and sundries are being added to the  
stove, cutlery and hardware business of C. L. &  
Theo. Baring, of Houston, Tex.





# The DAVIS & EGAN MACHINE TOOL CO.

SYNONYMOUS WITH SOLIDITY, DURABILITY, ACCURACY

Manufacturers  
and  
Designers of

ENGINE LATHES, TURRET LATHES  
MILLING MACHINES, UPRIGHT DRILLS,  
PLANERS, SHAPERS, BRASS WORK-  
ING TOOLS, RADIAL DRILLS, Etc.

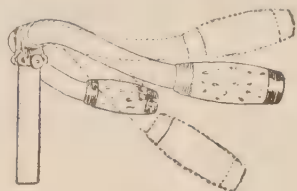
WORKS  
CINCINNATI, OHIO.

ST. LOUIS BRANCH  
720 NORTH SECOND ST.  
SEND FOR OUR HANDSOME NEW FOLDER

## A New Handle Bar.

The recent bicycle show at Madison Square Garden, New York, revealed many valuable improvements in the wheels for '96 over those of preceding years, and it seemed difficult for a close observer to suggest anything in the way of attachments or alterations that would add desirably to the bicycle's equipment.

A contrivance not exhibited at the bicycle show and which wheelmen who have used it consider exceedingly useful is a handle bar which may be quickly regulated to any one of three positions without the use of a wrench. In material and general appearance it is not unlike many other handle bars. It is designed to fit any machine, and, like other handle bars, it may be raised or lowered in the steering head. Its principal advantage lies in the readiness



with which the handles may be tilted up or down while the machine is going at full speed. By drawing back with the hands two small metallic pegs, located beneath the center of the handle bar, its position may be changed in a moment's time. While doing this the hands rest upon the bar, insuring perfect control of the wheel.

When a rider becomes tired of scorching and wishes relief from his cramped and unnatural position this arrangement enables him to graduate the pitch of his handles so as to sit perfectly erect or incline to a neutral posture. A scorcher's handle bar is often extremely welcome to wheelmen who utterly ignore scorching, or "wild-cat" cycling. For instance, the work of hill climbing is lessened very greatly by the use of low handles, as the rider by pulling up on them can put much more weight on the pedals. And by this new handle bar the change from one position to another may be made so easily that wheelmen look upon the invention with uncommon favor.

Another advantage of this device is that but a second is required to swing the bar around so that it may rest on a line with and flat against the frame of the machine, enabling one to round sharp corners or pass through narrow ways without danger of the handle bar conflicting with nearby objects. In this shape it also keeps the front wheel from turning when the machine is being carried. With the handles in this position the machine may be stood close against the wall without the liability of its running sidewise or backward and falling over.

Not the least important advantage of this handle bar is that it may be instantly removed clear of the machine without the use of either screwdriver or wrench. With the bar detached the wheel may be safely left outside, for, thus disabled, it will offer very little temptation to thieves.

## BICYCLE NOTES.

Razour & Handy, dealers in bicycles at Boston, Mass., are reported to have dissolved co-partnership.

Wolff & Co., who manufacture the Wolff-American bicycles, will open new ware-rooms at 8 East Forty Second street, New York.

The Bettys & Mabbett Company, who were recently incorporated at Rochester, N. Y., have increased their capital and are extending their manufacturing facilities. They make the Humming Bird bicycle.

It is reported from Melbourne, Australia, that Sutton Bros., an enterprising firm in that faraway land, is anxious to hear from American manufacturers of bicycles with a view of accepting an Australian agency.

The capital of the L. W. Thomm Cycle Company recently organized in Detroit, is \$15,000 and not \$1,500 as stated. A specialty will be made of the manufacture of an adjustable handle bar. The Pingree special will also be made.

A bicycle has lately been turned out by Tiffany & Company, in response to a demand for an ornamental bicycle that will certainly please the most fastidious of wheelmen. The first of these wheels manufactured by the Tiffanys was a man's wheel, which is described in a telegram as being decorated with sterling silver, in Louis XVI style. Carved ivory handles were added to the handle bars and other parts were decorated with good taste, without impairing the practicability of the machine or adding to its weight. A silver cyclometer and a silver decorated tool bag completed the outfit. The second, a lady's wheel, was sold the first day it was on exhibition. The front forks are richly overlaid with silver open work. The handles are of carved ivory, decorated with silver. The wheel is equipped with a front brake, a solid silver cyclometer, silver watch, bell and tool bag. Perhaps the most beautiful accessory is the solid silver lamp attached to the handle bar. There is a full nickel mud guard, ornamented with silver, a silver chain guard and a silver shield for the sprocket wheel.

## At the City Hall

At the regular weekly examination Thursday at the Boiler Inspector's Office for engineers' license there was but one applicant and he failed to pass. This is a record-breaker in this respect.

The Hadley combination order blank is gotten up for the convenience of and to fill the wants of the vast host of merchants and manufacturers who send out weekly, monthly or even occasional price lists of their goods asking for return orders. By this arrangement, you have compact in one sheet, a price list or circular, accompanied with a return order blank and envelope, self-addressed, requiring only the placing of a two-cent stamp to bring the order back to you. Another one of the advantages of this circular-order is, that it goes out for one cent, in a partially sealed condition, and the order blank facing price list is a good reminder that you want an order in return. For full particulars address W. H. Hadley, care of F. A. Drew Glass Company, St. Louis.

## Want Department.

SCRANTON, MISS., Feb. 11, 1896.

EDITOR THE AGE OF STEEL:  
I want a screw cutting lathe, 16 to 20 inches by about 12 feet between centers, second hand and in good order; also prices on second hand shapers—from reliable firms. Address

C. LUCE, Scranton, Miss.

A reader desires the names of manufacturers of drop hammers, grinding machines, polish stands and wheels; also of manufacturers of punching and shearing machines.

Address R. B., care The Age of Steel.

Addresses of several reliable contractors who build and equip roads and take bonds and stocks in payment; also of reliable bankers and brokers who underwrite construction bonds for building and equipping roads—are desired.

Address C. N. L., care The Age of Steel

JEFFERSON, TEX., Feb. 19, 1896.

EDITOR AGE OF STEEL:

We are in the market for the following:

- One 15 to 20 inch Crank Shaper.
- One 20 to 24 inch Back Geared Drill Press.
- One 72 inch Pulley Lathe, to swing not less than 8 feet between centers.
- One Pulley Moulding Machine and Patterns up to 36 inches.
- One 18 inch Engine Lathe, 8 or 10 foot bed.

Yours truly, W. K. HENDERSON,  
(Propr. Jefferson Foundry and Machine Shops, and manufacturer and wholesale dealer in lumber.)

A reader asks for the address of some manufacturer of small nickel-plated wire, suitable for use in making cuff holders.  
Address A. J. C., care The Age of Steel.

The address of some company manufacturing metal ties for railroad purposes is wanted.  
Address J. C.,  
Care The Age of Steel.

WINCHESTER, KY., February 19, 1896.

EDITOR THE AGE OF STEEL:

The Novelty Manufacturing Company, electrical and mechanical specialties, has recently been organized and is in the market for light machinery. A notice of the fact may prove profitable to some of your patrons. Very truly yours,

J. H. FIND,  
P. O. Box 169.

PORTLAND, ORE., February 17, 1896.

EDITOR THE AGE OF STEEL:

We wish to get the address of some firm who manufacture wrought iron leaves, flowers, etc.

Yours respectfully,  
PORTLAND WIRE AND IRON WORKS,  
C. W. Boost, Manager.

## Patents Issued During the Past Week.

The Age of Steel Patent Soliciting Agency, Messrs. Keller & Starek, attorneys, report the following list of patents granted southwestern inventors and manufacturers. We furnish free of charge pamphlets and circulars to those desiring to obtain patents:

- Machine for Cleaning Castings—Hans Reeg, Durlach, Germany.
- Oil Burner for Locomotives—Wm. Booth, Los Angeles, Cal.
- Car Truck—John A. Brill, Philadelphia, Pa.
- Differential Brake Lever—John A. Brill, Philadelphia, Pa.
- Vehicle Axel—Henry M. Powell, Florence, Ga.
- Car Coupling—John F. Smith, Burbank, O.
- Bicycle Frame—C. E. Tomlinson, Syracuse, N. Y.
- Carriage Axle—E. P. Jordan, St. Louis, Mo.
- Car Truck—Frank L. Lamkey, St. Louis, Mo.

A printed copy of the specification and drawing of any patent in the foregoing list will be furnished from this office for 25 cents. In ordering remit to Age of Steel patent department.



## TO SUBSCRIBERS AND THE PUBLIC.

Any paid subscriber of "The Age of Steel"—Weekly, Mechanical or Hardware editions—may insert a "For Sale," a "Help Wanted," or a "Situations Wanted" advertisement of not more than 50 words twice in these columns without cost. For any excess over 50 words, cents a word per insertion will be charged.

Parties desiring to purchase machinery, mechanical supplies or hardware goods; or to invest in a business; or in need of catalogues or information, may make their wants known through our reading pages without cost. Or, if preferred, letters of inquiry will be treated as private correspondence and receive attention as such. Address,

THE AGE OF STEEL.

Equitable Building, St. Louis, Mo.

## SECOND-HAND MACHINERY.

Iron Planer, 60 in. x 60 in. x 16 ft., four heads, Betts make.  
Iron Planer 34 in. x 26 in. x 7 ft.  
Iron planer 7 in. x 26 in. x 24 in.  
Iron Planer 24 in. x 24 in. x 1 ft. 1 32 in. x 25 in. x 6 ft. 6 in.  
1 60 in. x 20 ft. A 1 Engine Lathe.  
1 36 in. x 22 ft. Engine Lathe.  
1 26 in. x 18 ft. Blaisdell Lathe.  
1 Engine Lathe, 53 in. x 18 ft., L. W. Pond make.  
1 Heavy Roll Lathe.  
1 Engine Lathe 30 in. x 14 ft., Putnam make.  
1 Drilling Machine 45 in., B. G. S. F., 128 inch B. G. S. F., both New Haven.  
1 2000 lb. Ferris & Miles Steam Hammer.  
1 300 lb. Bement, Miles & Co. Steam Hammer.  
1 5-ton Foundry Crane.  
All kinds of Iron and Wood Working Machinery. Lists sent. NEW YORK MACHINERY DEPOT.  
Office, 178 Broadway, N. Y.

## FOR SALE—Special Offerings.

1 10-pound Vulcan Power Hammer.  
1 40-pound Bradley Helve Hammer.  
1 No. 2 W. W. & Co. Bulldozer.  
1 No. 2 Morton Key-way Cutter with Key-making and Binder Attachment.  
1 28 in. x 11 ft. New Haven Lathe.  
1 Slate 13 in. No. 1 Sensitive Drill.  
1 Acme Sensitive Drill.  
1 36 in. Automatic Gear Cutter.  
1 15 in. x 6 ft. Screw Cutting Engine Lathe.  
1 6-spindle Automatic Hendey Drill.  
1 3-spindle Slate Sensitive Drill.  
1 Single Axle Lathe.  
New Machine Tools, all kinds, at Manufacturers' Prices.

A. B. BOWMAN, Agent,  
823 North Second Street,  
St. Louis, Mo.

## FOR SALE.

## Engine and Boiler.

A horizontal stationary engine, 8x12 inches, and a horizontal tubular boiler, 3x10 feet. All complete and as good as new, except stack, used about three months. Price, f.o.b. here, \$200. Address

T. D. GUTHRIE,  
Galva, Ill.

## MACHINERY BARGAINS.

Before removal from the works PHENIX IRON WORKS, TRENTON, N. J.  
72 in. x 30 ft. engine lathe  
50 in. x 30 ft. " "  
37 in. x 30 ft. " "  
29 in. x 12 ft. " "  
29 in. x 12 ft. " "  
24 in. x 12 ft. " "  
Milling machine  
Gear cutter  
2 in. bolt cutter

Ten ton Brown derrick, punch and shear, anvil, etc.  
Send for list of all the machines.

GEORGE PLACE MACHINE CO.  
86 Liberty St., NEW YORK.

## SECOND-HAND MACHINERY SPECIAL BARGAINS.

84 in. x 20 ft. Lincoln Engine Lathe (triple geared).  
54-61 in. x 22 ft. New Haven Engine Lathe (triple geared).  
50 in. x 16 ft. Lowell Engine Lathe (triple geared).  
144 in. x 34 ft. Gap Lathe. A bargain.  
One each 26 in. x 12 ft., 13 ft. and 17 ft. D. W. Pond Lathe, C. R. & P. C. F.  
24 in. x 10 ft. Pratt & Whitney Engine Lathe, C. R. & P. C. F.  
26 in. x 12 ft. New Haven Engine Lathe, C. R. & P. C. F.  
48 in. Bement Car Wheel Borer.  
74 in. x 54 in. x 23 ft. Vulcan Planer.  
The above list contains only a few of our many bargains.

## 700 Machine Tools in Stock.

Send for Lists.

Prentiss Tool & Supply Co.,  
115 Liberty St., NEW YORK.  
CHICAGO STORE, 22 & 64 S. Canal St.

**Architecture,**  
Architectural and Mechanical Drawing, Electricity, Steam Engineering (Stationary Marine, Locomotive, Plumbing, Heating, Civil Engineering, Coal and Metal Mining, English Branches).  
**TAUGHT BY MAIL.**  
Twenty-seven Courses of Study. Send for Free Circular. State subject you wish to study.  
The International Correspondence Schools,  
SCRANTON, PA.

## EXPANSION BOLTS.



For Fastening all kinds of Structure to Brick and Stone Work.

Patentee and Mfr. ISAAC CHURCH,  
Send for Catalogue. 1521 Walnut St., TOLEDO, O.

## ANDREW MAYER,

10 Wall Street, NEW YORK.

## Investments.

Loans on Collateral.

Commercial Paper.

Capital Procured.

Street Railways.

Electric Light Plants.

Gas and Water Works.

Constructed and Reorganized.

## CORRESPONDENCE SOLICITED.

## FOR SALE.

## Engines and Machinery.

1 Large Mulay Saw Mill and machinery, complete.  
1 Engine, 9x16, complete, with fly wheel.  
2 Twin Engines, 10x20, link motion and reversible.  
1 Brown's Shingle Machine.  
1 Dummy Engine and Log Car, for hauling logs, for standard gauge track.  
All the above will be offered cheap. For particulars call on or address  
THE KNAPP, STOUT & CO. COMPANY,  
Hall and Salisbury Sts., St. Louis.

## FOR SALE.

1 26 in. by 26 ft. Engine Lathe.  
1 16 in. by 8 ft. Engine Lathe.  
1 Traveling Head Shaper.  
1 25 in. Hendey Shaper.  
1 6-spindle Drill Press.  
1 4-spindle Drill Press.  
1 Heavy Post Drill.  
1 Horizontal Boring Machine.  
1 20-ft. Shafing Straightener and Centering Machine combined.  
1 38 in. Pulley Lathe.  
1 8 ft. Pit Lathe.  
1 12 in. by 18 in. Center Crank Engine.  
1 10 in. by 20 in. Engine.  
1 14 in. by 24 in. Automatic Cut-off Engine.  
1 16 in. by 42 in. Corliss Engine.  
Also a lot of miscellaneous tools: brick machines; disintegrators or pulverizers; hoisting engines, etc.  
SCHOELLHORN-ALBRECHT MACHINE CO.  
610 North Levee, St. Louis, Mo.

## FOR SALE.

## HARDWARE, IMPLEMENT AND BUGGY BUSINESS.

Here is an exceptional chance for some one to step into a well established profitable business—the leading one of its kind in an Iowa town of 6,000. This stock is clean, new and well assorted.

It occupies a new brick building, built expressly for this business. Party purchasing the stock may buy the building or lease it on favorable terms.

The present owners are interested in another line of business to which they desire to devote their entire energy.

We can give as references leading wholesale houses in Chicago, St. Louis and St. Paul. Particulars on application to M. J. LORD & THOMAS, Chicago, Ill.

## FOR SALE.

Tools and entire contents of the Eagle Foundry and Machine Shop, of Little Rock, Ark.  
Address JOHN MCGUIRE,  
102 Commerce St., Little Rock, Ark.

## Wanted—A Die Maker.

An expert die maker for metal-wo king tools. One who has had experience in a small, but progressive, first-class Eastern shop preferred. Address

FRED J. SWAINE,  
207 Chestnut Street, St. Louis, Mo.

## SECOND-HAND TOOLS.

1 17"x8' Lincol B. G. S. C. lathe.  
1 16"x6' Am. T. & M. Co. turret lathe.  
1 15"x5' Am. T. & M. Co. square arbor lathe.  
1 15"x6' square arbor Fox lathe.  
1 18" B. G. P. F. drill.  
1 15"x6' P. & W. hand lathe with slide rest.  
1 Stewart hand lathe, C. S. and foot power.  
1 Water tool grinder and pump.  
1 Marking machine.  
DWIGHT SLATE MACHINE CO.,  
HARTFORD, CONN.

## RADIAL DRILLS.

## LATHES.

14 in., 16 in., 18 in., 22 in., 24 in.

24 in. x 36 in. } DOUBLE SPINDLE.  
25 in. x 42 in. }

The following merchants keep a full line of our tools constantly in stock:

J. J. McCABE, 14 Dev St., NEW YORK.

DAWSON &amp; GOODWIN, 57 S. CANAL ST., CHICAGO.

DIETZ, SCHUMACHER &amp; CO., Cincinnati, O.

## ST. LOUIS STEAM ENGINE COMPANY,

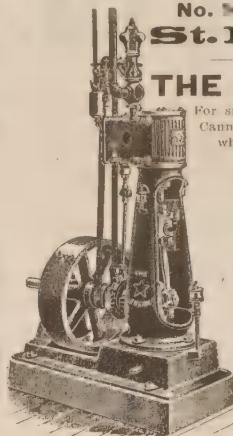
No. 2 S. Commercial St.,

St. Louis, Mo.

—MANUFACTURERS OF—

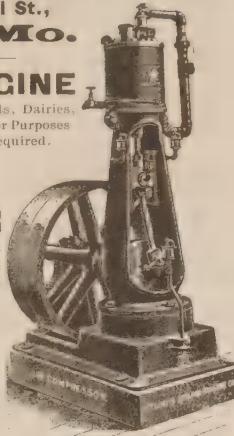
## THE STAR ENGINE

For small Electric Light Plants, Dairies, Canning Factories and All Other Purposes where from 3 to 20 h. p. is required.



## THE STAR AIR COMPRESSOR

The latest and best design for Pneumatic Tools, Oil Burners, Air Hoists, Breweries, etc.



## SPECIAL DISCOUNTS TO THE TRADE.

## FOR SALE.

Ten Miles, more or less, Spiral Weld Pipe, 8 in. I. D., tested to 250 lbs. pressure, coated with the usual coal tar composition; couplings for lead pipes; pipe lengths, 16 ft. to 18 ft.; weight of pipe, 6 lbs. per foot. Tender will be received for this pipe f. o. b. Chicago, where it may be seen, if desired.  
Address all communications to  
J. E. McLEROY,  
287 Wabash Avenue, CHICAGO.

## FOR SALE.

1 Hamilton-Corliss 80 h. p. engine.  
1 Milburn 85 h. p. tubular boiler; been used only a few months.  
For particulars apply to or address  
JAS. G. GRAHAM, Memphis, Tenn.

## RAILS.

A lot of relaying iron T rails, 35 pounds per yard, in good condition, with splices.  
MANOGUE-PIDGON IRON CO.,  
MEMPHIS, TENN.

Dealers in mill supplies and roofing material.

## FOR SALE.

Four engines, four boilers, saw mill rig and carriage, edger, trimmer, lath machine, cut-off saw and rig, one dummy engine, about one mile tee rail. All in good condition.  
JNO. F. RHODES, RECEIVER,  
Earl, Ark.

## NOTICE.

Will sell, or reorganize with more capital, a manufacturing business producing the best and most marketable metal roofing now offered to the trade, including superior special tools for laying metal roofing; all covered by patents. A rare opportunity. Address X,  
Care The Age of Steel.

## WANTED.

An up to date foundryman desires a position as superintendent or foreman; if necessary will fulfill both. Capable of melting iron and manipulating a foundry upon scientific and the cheapest known principles. Correspondence strictly confidential. Address  
G. H. office.

## A RARE CHANCE

To step into an old and established steam boiler, etc., manufactory in a prosperous Western city. Will sell, lease or take in an active partner with means. Reason, advanced age of owner.  
Address "O. S." care The Age of Steel

## WANTED—A POSITION

As a sheet iron worker or boiler maker by a good, reliable man, former preferred. Can give best of references. Will go anywhere.  
Address J. W. S.,  
No. 110 S. Race St.,  
Springfield, O.

## Second-Hand Rails.

Wanted, in good condition, in lots of 100 to 3.0 tons; sizes, 16-lb. and upwards. Address  
Post Office Box 1411,  
Denver, Col.

## RADIAL DRILLS.

## CRANE'S PATENT PORTABLE HAND DRILLS.

No. 2 weighs 30 lbs. Drills to 4 1/2 inch.  
No. 3 weighs 22 lbs. Drills to 3 1/2 inch.  
No. 4 weighs 12 lbs. Drills to 2 1/2 inch.  
No. 5 weighs 4 1/2 lbs. Drills to 1 1/2 inch.  
No. 2 has Pawl Wrench and Ratchet.  
No. 2, 3 and 4 are fitted to use 1/2 inch straight shank drills.  
No. 5 is fitted for 3/4 inch straight shank drill, also for the Almond 5-16 drill chuck.  
Any chuck fitted to either size to order.

C. H. TUCKER, JR.,  
Agent,  
No. 135 Greenwich Street,  
NEW YORK CITY, N. Y.





# EMPIRE BICYCLES.

We shall carry a complete stock of these popular wheels in 1896.

They have all modern features and are worthy of your close inspection.

Hose Pipe Tires are greatly in demand. We shall use the Vim, the best to be had.

## A. F. Shapleigh Hardware Co

Washington Avenue and Fourth Street,  
ST. LOUIS, MO.

## NICHOLSON FILE CO.

We SOLD in the year 1895

35 per cent More Files and Rasps  
than in any previous year of our history.  
This does not include our new acquisition, the  
**GREAT WESTERN BRAND.**

SEND FOR  
CATALOGUE.  
450 Illustrations.

MENTION THIS  
PAPER.

Do you want a better  
IF SO

RECOMMENDATION?

TRY OUR FILES.

THEY ARE THE BEST.

PROVIDENCE, R. I.



**POWELL'S GLASS A SIGHT UP FEED LUBRICATOR.**  
HANDSOME DESIGN—FINELY FINISHED.  
PERFECT CONSTRUCTION—SATISFACTION GUARANTEED.  
THE W. POWELL CO. — CINCINNATI, O.

DETROIT SUPPLY CO., Western Agents, St. Louis, Mo.

## AMERICAN BRAND

Corrugated Iron.  
Standing Seam Steel Roofing.  
Roll and Cap Steel Roofing.  
"V" Crimp Steel Roofing.  
Sheet Steel Clapboards.  
Sheet Steel Pressed Brick.  
Sheet Iron Shutters.  
Galvanized Gutters.  
Down Spouts.  
Paints and Cements.

**AMERICAN ROOFING CO.,**

ST. LOUIS.

CINCINNATI.

# PATENTS!



**THE AGE OF STEEL**  
PATENT SOLICITING AGENCY.

ST. LOUIS, Equitable Bldg. WASHINGTON, 508 Fifth St. N.W. NEW YORK CITY, 1313 Vanderbilt Bldg.

## KELLER & STAREK, ATTORNEYS

CHARLES F. KELLER, Mechanical and Electrical Engineer.  
EMIL STAREK, E. M., Counselor at Law, (Late of Examining Corps, U. S. Patent Office.)  
Member American Inst. Mining Engineers.

IN CHARGE OF PATENT DEPARTMENT.

PATENTS OBTAINED WITH CLAIMS FULLY COMMENSURATE WITH THE SCOPE OF  
THE INVENTION. ALL DRAWINGS EXECUTED AT OUR OFFICE BY  
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Correspondence Solicited.

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HAVING HAD YEARS OF PRACTICAL EXPERIENCE BOTH IN THE SOLICITATION OF PATENTS AND THE EXAMINATION OF CLAIMS IN  
THE U. S. PATENT OFFICE, WE FEEL CONFIDENT OF ADEQUATELY PROTECTING THE INVENTOR BY PROPER CLAIMS  
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AND IS INDEED THE MEASURE OF THE INVENTION. METALLURGY, STEAM ENGINEERING,  
ELECTRICITY, MINING AND CIVIL ENGINEERING, CHEMISTRY AND KINDRED  
ARTS A SPECIALTY. ALL BUSINESS CONFIDENTIALLY TRANSACTED.

ADDRESS **AGE OF STEEL PATENT SOLICITING AGENCY,**  
EQUITABLE BUILDING ST. LOUIS MO.



# THE MARKETS.

## IRON, STEEL AND METALS.

OFFICE OF THE AGE OF STEEL,  
St. Louis, Mo., Feb. 21, 1896.

The iron trade appears to be in close sympathy with, and responsive to, general business conditions, which are quiet and without definite prospects for the immediate future. Somehow and in some way the \$100,000,000 bond sale has failed woefully as a business invigorant, as shown by the closeness of money, the list of failures and bank clearings.

Moreover, aside from general causes, the iron trade is adversely affected by the sustained large production of the furnaces from last fall's unparalleled work. The decrease in furnace output between January 1st and February 1st, while amounting to 9000 tons, still left the weekly make at the latter date only 4000 tons less than on October 1st, and only 20,000 tons under the prodigious figures at the beginning of November, 212,000.

Such a statistical situation at a time of currency contraction resulting from the Government's efforts to raise gold for the reserve, and the unprofitable character of general business, has completely eliminated speculation from the policy of iron buyers. So, while consumption in many lines has held up reasonably well, disinclination to anticipate wants, as in times of confidence, has aggravated the situation at the producers end, particularly at the furnaces, where stocks showed a considerable increase at the beginning of the month, consistent with another considerable increase in December.

Naturally, therefore, the crude iron and steel markets have been recently pointing toward lower prices, in spite of the resistance offered to cheaper Bessemer pig and billets through the combination-controlled Lake ore and Connellsville coke. This, in turn, has arrested introductory efforts to advance prices of finished iron and steel recently observed, and which found warrant and opportunity in previous advances in Bessemer pig and steel.

To-day the markets are quiet all around, and price cutting, heretofore more largely confined to middlemen, is increasing among the manufacturers themselves, and promises—should trade not materially increase before long, as is hoped, and as it may—to test the stability of some of the combinations among producers.

In metals the situation is a strong one. Trade in copper, tin and spelter is in good shape at the full advances made of late.

### ST. LOUIS.

A quiet state of affairs is reported in the pig iron market. Orders are severally small, and at the same time rather limited in number. The larger sales in Southern iron have ranged from 100 to 300 tons, at prices 25 to 50 cts. under the market. The leading Southern furnace companies, however, continue to hold firmly to \$8.50 for No. 1 and \$8.25 for No. 2 foundry, Birmingham.

Nominal quotations f. o. b. cars, St. Louis:			
Southern coke irons.		Miscellaneous.	
Foundry, No. 1.	\$12.03	Ala. c. c. f. dry.	\$16.00
Foundry No. 2.	11.75	Ala. c. c. car wheel	16.50@17.00
Foundry, No. 3.	11.50	Missouri	12.50@13.00
Soft, No. 1.	11.75	Lake Supr.	15.50@16.00
Soft, No. 2.	11.50	Missouri Bessemer	@13.00
Grey forge	11.25	Ohio softeners	16.00
Mottled	11.50		

**IRON AND STEEL BARS.**—The bar market presents about the same features as last week. Trade from store is of moderate volume, something better than a year ago, but still not by any means satisfying to jobbers. The Association mills continue to quote iron at \$1.35 East St. Louis, and are holding faithfully to that figure, but prices are unsettled and cut freely, both for iron and steel, to all the larger consumers.

### Quotations:

Bar steel, in car lots	.....	\$1.60@1.65
Bar steel, less than car lots	.....	1.85
Bar iron, in car lots, East St. Louis	.....	1.85
Bar iron, less than car lots	.....	1.40@1.50

The Ewald Iron Company, St. Louis, quote as follows out of store:

Bar iron.....	\$1.50	rate	E. I. C. c. c iron	3.25@3.60	rate
Boone iron bars.	2.10@2.20	rate	Tenn c. c. bloom	5.00@5.50	rate

**PLATES AND SHEETS.**—The movement is rather light at this time. The only feature is a somewhat improved demand for Nos. 10, 12, 14, 16 and 18 sheets, and for galvanized and corrugated material. Nominal prices for small lots from local stock:

1/4 inch and heavier tank steel	.....	2.00c
3-16 inch and No. 8 tank steel, 60 inches wide and under	.....	2.10c
3-16 inch and No. 8 tank steel, over 60 inches wide	.....	2.20c
Flange steel	.....	2.40c
Flange steel heads	.....	2.55c
No. 10 soft steel	.....	2.20c
No. 12 soft steel	.....	2.30c
No. 14 soft steel	.....	2.40c
No. 16 soft steel	.....	2.55c
No. 18 soft steel	.....	2.65c

**MERCHANT STEEL.**—There is very little to say under this head. Neither specifications on old contracts nor new business are reaching the mills any too freely. Locally demand is reported slow by the stores.

MERCHANT AND AGRICULTURAL STEEL.					
Open hearth tire	per lb.	2.10c	Open hearth toe calk	...	2.20c
" spring	.....	2.40c	" plow—slabs	"	2.30c
" machinery	"	2.10c			
Solid cast plow—slabs	.....	per 100 lbs.	2.70		
Crucible cast plow—slabs	.....	.....	3.25		
Soft center plow—slabs	.....	.....	6.00		

TOOL STEELS.					
Crucible cast	per lb.	6@6 1/2	Superior cast	per lb.	10@10 1/2
Extra cast	.....	12@12 1/2	Double extra	.....	17c
Special	.....	18c	Self hardening	.....	37 1/2@40c
JESSOP'S STEEL					
English tool	per lb.	15c	English tool, dia.	per lb.	16c
Double shear steel	.....	15c			

**JESSOP'S STEEL.**

English tool	per lb.	15c	English tool, die	per lb.	16c
Double shear steel	.....	15c			

The Ewald Iron Company, St. Louis, quote:

Crucible tool steel	.....	7c
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The Carpenter Steel Co., New York and St. Louis, quote high grade crucible steels as follows:

Standard	.....	13c	Double special	.....	30c
Extra	.....	15c	Air hardening	.....	1c
Special	.....	20c			

**PIPES AND TUBES.**—Advices from the mills indicate that prospects are considerably improved, and that a fair spring business is looked for. In the local market trade is increasing gradually, and there is, perhaps, not so much extreme cutting of prices.

Nominal quotations for small lots from local stock:

1 1/4 inch and under, black pipe	.....	57 & 10 & 10 & 5
1 1/4 " " galvanized	.....	52 & 10 & 10 & 5
1 1/2 " " upwards, black	.....	57 & 10 & 10 & 5
1 1/2 " " galvanized	.....	55 & 10 & 10 & 5
Less than car load lots same as bases and one 10 only.		

Boiler tubes and casing from St. Louis stock:

2 1/4 inch and under, 67 1/2 off	Casing, inserted joint	.....	47 1/2@5
2 1/2 in and upwards	70 " Casing, socket	.....	52 1/2@5

**STRUCTURAL MATERIAL.**—The local outlook for structural material continues to improve. Quite a good deal of figuring is now in progress. Prices, delivered, St. Louis: Angles, \$1.60; beams, channels, tees, \$1.75; steel bars, \$1.45 half extras.

**STEEL RAILS.**—Quite an improvement has shown itself in the demand for light rails, 30 to 35 pounds, for logging roads. Standard rails are moving only in small orders. Quotations: Standard rails \$30.60, East St. Louis; splice bars, \$1.62 1/2; spikes, \$1.80; bolts, square nuts, \$2.30; with hexagon nuts, \$2.40; steel links and pins, \$1.65.

**OLD RAILS AND CAR WHEELS.**—There is plenty of inquiry for old car wheels, but little for rails. In the absence of any known prices in sales of wheels we quote them at about \$14. Old iron rails are in the neighborhood of \$14; old steel rails, \$9 to \$11 according to condition.

**SCRAP IRON, STEEL AND METALS.**—There has been a good demand for almost everything in the scrap line the past week. No. 1 railroad wrought and good steel and cast scrap have sold readily, and old metals have also been in brisker movement. Old iron rails have not been offering in any large quantities, and are selling at somewhat higher figures than for several weeks past.

F. o. b. cars, St. Louis, per ton of 2000 lbs.

F. O. B. car, St. Louis, per ton of 2000 lbs.				
No. 1 R. R. wrought iron	13 00	Cast iron borings	.....	5 00
Old car wheels, net	13 00	Steel springs, mixed	.....	11 50
Heavy sheet iron	6 75	Cast iron, heavy	.....	9 00
Malleable	7 00	Stove plate	.....	5 50
Axle turnings	7 50	Mixed steel	.....	9 00
Machine turnings	5 50			

### Old metals:

Light copper, per lb., cts.	9 1/2	Heavy brass, per lb., cts.	9
Heavy copper, " "	10	Lead .....	3 1/2
Light brass, " "	6	Zinc .....	2 1/2

## PITTSBURG.

Pittsburg, Feb. 18, 1896.

The past week has developed very little new in the iron and steel trade. The entire situation seems to be about that of a week ago. Producers are fairly busy, and in the main lines there is considerable business being done. It must be admitted, however, that things are not what was expected a short time ago, when it was thought that the settlement of the bond issue would at once stimulate trade. As yet, the demand in the iron and steel trade is nothing like a push, but there is a steady call for material and prices are holding rather firmly. There is a great deal expected with the coming spring, and iron and steel makers believe that a good trade will be seen before long.

**PIG IRON.**—The pig iron situation shows nothing new this week. There is not as much iron being made just now as there was a few weeks ago, and the market is not being pushed as hard. The furnaces are still in no great haste to sell very far ahead at present, while they will make concessions to effect an immediate sale. This about shows the condition of the pig iron trade. The consumption of pig iron just now is not very large, as none of the mills are hard pushed, and the foundries are dull. This week prices are a shade lower than they were at last report. Bessemer is \$12.50@13; grey forge \$11; No. 1 foundry \$13; and No. 2 \$12@12.50.

**MUCK BAR.**—There is little doing in muck bar just now and the figure still quoted is \$20.50.

**SHEET BARS.**—The demand in this line is rather slow, and the prevailing figures remain at \$17.50@18.

**GALVANIZED SHEETS.**—There is a pretty fair trade doing in galvanized sheets. Prices are well held with discount rates remaining at 75 & 10 off in car load lots, and 75 off in smaller quantities.

**FINISHED MATERIAL.**—The finished iron trade shows up nothing new this week. There is none of the mills completely closed, but nearly all have some idle capacity and only a few are hurried. The orders now on the books do not run very far into the future. The sheet iron trade shows the most complaint, as prices are being cut by mills scrambling for orders. Generally, prices are held pretty firmly. Iron bars, 1.25c; steel bars, 1.20@1.25c; steel tank plates, 1.40@1.45; No. 24 sheets 2.20@2.25c; No. 27, 2.30c; skelp iron, 1.25@1.30c for grooved, and 1.35@1.40c for sheared. Skelp steel, 1.10@1.15c for grooved, 1.15@1.20c for sheared.

**CORRUGATED ROOFING.**—This branch remains about as it was at last report, with prices unchanged. No. 24 gauge, \$3; No. 26 gauge, \$2.40; No. 27 gauge \$2.35; No. 28 gauge, \$2.10.

**BLOOMS AND BILLETS.**—While there has been no big slump in Bessemer steel, the market is easier than it was last week. Buyers are still holding off and concessions are being made. The figures this week appear to be \$17.50@17.75, with a few holding for higher rates.

**STRUCTURAL MATERIAL.**—There is every sign of a good trade in the spring, and the mills are quite well employed. Prices are being held steadily. Angles, 1.40@1.45c; tees, 1.60@1.65c; beams and channels, 1.50@1.55c; refined bars, 1.35@1.40c.

**WROUGHT IRON PIPE.**—Present indications are that the wrought iron pipe trade will be quite active in the spring. Prices remain as they were, with base rates reported as follows:

	Per cent. Base.
Butt Welded, Black .....	55
" " Galvanized, .....	60
Lap " Black .....	65
" " Galvanized, .....	52½

**SCRAP IRON AND STEEL.**—There is not much doing in scrap material and prices are rather weak. No. 1 railroad wrought \$13 net; hammered iron car axles, \$18.50@19 net; wheels \$11 per gross ton; cast scrap \$11 per ton; cast iron borings per ton, \$7.

## BIRMINGHAM.

Birmingham, Ala., February 18, 1896.

The recent sale of bonds by the United States has created a little more confidence in the pig iron market and the demand in this district is beginning to pick up, though no change in the quotations is to be noted. It is not at all satisfactory, however, at the rolling mills, but furnacemen do not complain except as to quotations. The market is nothing like it was three months ago, nor is it as low as it was the last



month in last year. The demand is right brisk, but confined to small orders and immediate deliveries. Production is quite heavy, and at present the prospects are for a continuance of steady work.

The furnaces are working with a vim and the production is almost as large as it was some weeks back.

**THE ROLLING MILLS.**—The Alabama Rolling Mills at Gate City, near here, were shut down for a few days this month on account of the few orders on hand. The men did not like it much, but had to accept the situation. The Birmingham Rolling Mills are working steadily, but it is said there is not much demand.

**THE ANNISTON PIPE WORKS.**—The Anniston Pipe & Foundry Company having purchased outright the splendid plant which it has been operating for the past three years under a lease, will make some extensive improvements in the next few weeks. There are six large pits in the big shop, but only five of these are equipped, and of the five only four have been in use. The company will put the fifth pit in operation and also equip and operate the sixth pit in the manufacture of sixty-inch pipe, an unusually large size. These new pits will give employment to something over one hundred additional men. The company is considering other changes and improvements, one of which is the substitution of electricity for steam as a motive power, and it is very likely that this will be done within the next few months.

## NEW YORK.

New York, Feb. 18, 1896.

Trade has been quiet, though signs of improvement are apparent. Prices, however, have been unsteady and irregular, and are by no means helpful to the general situation. It is expected that an increased confidence in financial circles may have a good effect on business. This, however, remains to be seen, meanwhile business waits for the long expected boom.

**PIG IRON.**—Sales during the past week have been above the average, and the total of business actually done made a fair showing. The market, however, is weak and prices unsteady. Quotations are as follows: Northern brands, No. 1 foundry, \$12.75@13.25; No. 2, \$12.00@12.50; grey forge, \$11.25@11.75; Southern brands No. 1 foundry, \$12.50@12.75; No. 2, \$12.00@12.25; No. 1 soft, \$12.25@12.75; No. 2, \$12.00@12.25, tidewater delivery.

**RAILS AND FASTENINGS.**—There has been but little doing, and inquiries and orders so far have not been heavy. Present quotations: Standard rails \$28 and upwards at tidewater; spikes, \$1.60@1.75; fish plates, \$1.25@1.30 at mill; bolts and square nuts, \$1.90@2.00; hexagon, \$2.00@2.10.

**STRUCTURAL MATERIAL.**—Indications point to an early increase of business, though at present the situation is tame. Quotations for large lots are: Angles, \$1.40@1.50; beams up to 15 in., \$1.55@1.65; tees, \$1.65@1.75; channels, \$1.60@1.70 on dock.

**MERCHANT STEEL.**—There is no change to report in the situation. Prices remain about the same. Nominal quotations are: soft steel bars, \$1.25@1.30; steel axles, \$1.70@1.80; refined bars, \$1.35@1.50; steel hoop, \$1.55@1.65.

**OLD MATERIAL.**—The market is without feature and generally dull. Quotations are: Old car wheels delivered \$10.50 @11.00; old iron T rails, \$12.50; old steel rails, \$11.00@11.50 f. o. b. Jersey City.

## CHICAGO.

Chicago, Feb. 18, 1896.

An improvement is noted in the movement of iron and steel. It is slight but actual. The tone of the market is hopeful and more firmness is noted in prices. Buyers show some anxiety to secure contracts at present rates on long delivery. This is not shared by dealers. Considerable business, however, is reported as on the way, and the resumption of work at the idle plants of the Illinois Steel Company indicates a favorable showing for prospective trade.

**PIG IRON.**—Some good sales have been reported during the week both of Lake Superior charcoal and of Southern iron. An increase of demand is noted by car wheel manufacturers, and the agricultural implement maker has also been in evidence. Prices show more strength as a rule. Quotations are as follows: Lake Superior Charcoal, \$14.00@14.50; Coke No. 1, \$12.75@13.35; No. 2, \$12.50@12.75; No.

3, \$11.75@12.25; Southern Coke, No. 2, \$12.35@12.60; No. 3, \$11.85@12.10; Ohio Strong Softeners, \$15.50; Alabama Wheel, \$17.25@17.75.

**STEEL RAILS.**—Demand continues moderate, though a respectable aggregate is being made of small orders. Quotations: Standard steel rails \$29 and upward. Spikes, \$1.75@1.80; track bolts, hexagon, \$2.30@2.40; square nuts, \$2.15@2.25; splice bars, \$1.35@1.45.

**STRUCTURAL IRON AND STEEL.**—There has been a revival of inquiry and several important contracts are pending. The outlook is said to be promising. Present quotations as follows: Tees, \$1.75@1.85; angles, \$1.50@1.60; universal plates, \$1.65@1.70; beams and channels, \$1.65@1.75.

**MERCHANT IRON AND STEEL.**—Business has been more satisfactory and a very fair aggregate has been made. Inquiries are still in order, and the outlook generally is of an encouraging nature. Quotations are: Tool steel, \$5.50@7.50; smooth finished machinery, \$1.75@1.80; smooth finished tire, \$1.65@1.70; open hearth machinery, \$2.00@2.10; Bessemer bars, \$1.55@1.65.

**OLD RAILS AND CAR WHEELS.**—There has been a good demand for old wheels, that for rails being without any new feature. Quotations: Old wheels, \$13.50@14.00; old iron rails nominal at \$14.50; old steel rails, \$10.00@11.00, according to length.

## PIG IRON.

### Agency Reports.

#### At Cincinnati.

On February 18th, Messrs. Rogers, Brown & Co., Cincinnati, O., reported as follows:

But little of interest has developed during the past week. There was not the improvement that many expected after the settlement of the bond issue and money at the leading centers is only fairly easy. No plethora is yet apparent.

The rate of production of pig iron has been largely decreased, but stocks have increased since January 1, and are now about the same as one year ago. Reports of the foundrymen located in all parts of the country indicate a hopeful feeling, although a large number say their present melt is not much in excess of last year at a corresponding time. In spite of the quiet period natural to this season, the belief is prevalent that prices will tend upward and some of the large stove interests in the central West have covered their probable requirements for the twelve months. Other consumers of importance are watching the trend of affairs carefully and stand ready to contract as soon as greater strength in prices is developed.

The Southern producers are confronted with the late cut in prices by furnaces in the Chicago district, that from their stand point seems unnecessary. Pittsburgh and Valley furnaces are also quoting foundry and forge irons at prices lower than those of the Alabama district and to-day there is consequently a restriction of distribution of Southern brands.

We quote for cash f. o. b. cars, Cincinnati.

Southern coke, No. 1 foundry	\$11.50 @ \$11.75
Southern coke, No. 2 foundry	10.75 @ 11.25
No. 1 soft	10.75 @ 11.00
Lake Superior coke, No. 1	13.00 @ 13.50
" " " " " "	12.00 @ 12.50
Hanging Rock charcoal, No. 1	16.00 @ 17.00
Tennessee charcoal, No. 1	13.50 @ 14.00
Jackson County Silvery, No. 1	14.00 @ 14.50
Southern coke, gray forge	10.00 @ 10.25
Southern coke, mottled	9.75 @ 10.00
Standard Alabama car wheel	15.75 @ 16.25
Tennessee car wheel	14.50 @ 15.00
Lake Superior car wheel and malleable	15.75 @ 16.25

#### At Pittsburgh.

On Feb. 17th, A. H. Childs, of Pittsburgh, Pa., reported as follows:

The market continues very quiet, but notwithstanding the light demand, there is evidently an undercurrent of strength and a growing belief that the lowest point has been passed, and that better prices will prevail. The apparent certainty that a higher cost of making iron is inevitable, has doubtless much to do with the present attitude of the trade. During the past week some Bessemer iron was sold at prices ranging from \$12.65 to \$12.90, but it is not probable that any could be bought to-day for less than \$13.00, and some of the furnacemen are refusing to take less than \$13.25. Quotations for the various grades rule as follows:

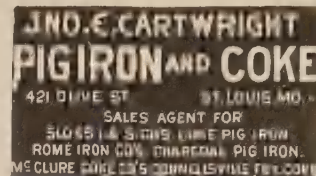
No. 1 foundry	\$13.25 @ 13.10
No. 2 foundry	12.50 @ 12.75
Grey forge	11.00 @ 11.25
Cold blast charcoal	26.00 @ 27.00
Warm blast charcoal	18.00 @ 20.00
Bessemer	13.00 @ 13.25

## Complimentary.

SMITH & DAVIS MFG. CO., St. Louis.  
MANUFACTURERS OF SPRINGS, WIRE AND IRON BEDS AND EXCELSIOR.

Messrs. J. W. Garratt & Co.,  
Gents:—We take pleasure in stating that we have been using your anti-friction metal for the past six years, and will say that it has given us entire satisfaction, and we consider it the best metal we have ever used.

Yours very truly,  
SMITH & DAVIS MFG. CO.,  
J. G. Smith, President.



## METALS.

**LEAD MANUFACTURES.**—The demand has been a little more active since our last for everything in this line. The orders have been principally from the country, with a light scattering demand from local customers. There has been an advance of 10c in sheet lead and lead pipe, and we accordingly revise our quotations, which are as follows:

Lead pipe	3.40c	Glaizer lead	5c
Sheet lead	3.90c	Bar lead	34c

Terms—Thirty days, 1 per cent off for cash. If paid within ten days of invoice date—f. o. b. cars at St. Louis, Mo.

**SPELTER.**—The market for spelter is stronger, and demand is somewhat brisker than for several weeks past. Prices, too, are firmer, and as we go to press \$3.80@3.85 are the quoted prices, with a tendency to still higher figures observable.

St. Louis shipments of spelter, in stabs	1895	1895
For January	112,368	68,866
For February, 20 days	81,384	71,167
Total	193,752	138,033

**PIG LEAD.**—This metal has been in fair demand, and the market stronger in tone the past week, with quotations at \$2.92½@2.95.

St. Louis receipts of lead, in pigs—	1895	1895
For January	113,556	108,983
For February, 20 days	74,270	76,910
Total	187,826	185,893

St. Louis shipments of lead, in pigs—	1895	1895
For January	81,090	65,947
For February, 20 days	38,670	35,208
Total	119,760	101,155

**COPPER.**—At New York the market closed quiet Wednesday at 10.50c to 10.65c for spot lake ingot; casting copper in car load lots, as follows: Baltimore, Orford and M. A., 10c; other grades, 10c; electrolytic, in car load lots, 10.37½c. Locally, the market is 10½c for small lots of casting from stock.

**TIN.**—The New York market was easier Wednesday. Closing prices were as follows: Spot February and March 13.35@13.40c; April, May and June 13.40@13.50c.

The local market is 15c for retail lots from stock.

## COAL AND COKE.

**COAL.**—Domestic demand has been quickened somewhat by the cold spell the past week, and the industries, too, have been in evidence to a larger extent. Dealers are, on the whole, very well satisfied with the business being done.

### EAST ST. LOUIS, CAR LOTS.

Ava	per ton \$ 85	Big Muddy	per ton 1 75
Percy	" " 1 10	Piedmont blacksmithing	3 75
Illinois (Standard)	" " 80		

Delivered prices to steam users in this city, from \$1.75 to \$1.90 per ton. Delivered prices to residences, \$2.75 per ton.

**ANTHRACITE—EAST ST. LOUIS, DELIVERED.**

Chestnut	per ton \$7.25	Egg	per ton 7.25
Stove	" " 7.25	Grate	" " 7.00

Birmingham Correspondence, Feb. 18.

State Mine Inspector, James D. Hillhouse, has obtained nearly a full report from all the coal mines and coke ovens operated in the State, and will soon be ready with his report to the Governor for the year 1895, showing the amount of coal and coke produced last year and number of employees. From the reports at hand the following figures for operations during 1895 have been secured: Jefferson County, miners employed, 4,906; amount of coal mined, 3,710,331 tons of 2,000 pounds each; number of coke ovens, 3,178; amount of coke produced, 1,301,881 tons. Walker County, miners, 2,276; coal produced, 944,041 tons; coke ovens, 260; coke produced, 2290 tons. Bibb County, miners, 1285; coal, 653,762, coke ovens, 467; coke, 33,835. Tuska-loosa County, miners, 677; coal, 208,117; coke ovens, 902; coke, 40,814. Shelby County, miners, 233; coal, 52,754 tons. Blount County, men employed, 95; coal, 62,400 tons. St. Clair County, men employed, 120; coal, 30,806 tons. Winston County, men employed, 20; coal, 4500 tons. Smaller mines in State, 25,000



tons of coal. The total production, 5,691,711 tons of coal; men employed, 9612; coke ovens, 4107; coke manufactured, 1,384,820 tons. The total production of coal in 1893 was 5,270,042 tons; in 1894, it was 4,361,312 tons. The increase for 1895 over 1894 was 1,330,399 tons. The total production of coke for 1893 was 1,063,902 tons; for 1894 it was 942,002 tons. The increase for 1895 over 1894 was 562,822 tons. In Jefferson County, 1500 convicts work in the mines. The production of coke and coal in 1895 was the greatest in the history of the State.

**COKE.**—There is a fair demand reported locally, and trade at all points seems to be quiet and devoid of feature.

IN CAR LOTS, ST. LOUIS.	
Connellsville foundry coke, 72-hr. Fry.	\$5 75
New River	5 25
Pocahontas	5 25
Crushed	5 90
Gas works coke, lump, per bushel	10c

Pittsburg Correspondence, Feb. 18.

The Connellsville region is increasing its coke production. The furnaces are taking more than they did a few weeks ago. Prices are steadily held, with furnace coke quoted at \$2. This is the price being paid.

#### PHILADELPHIA IRON MARKET.

[New York Metal Exchange Report.]

Business is in somewhat monotonous condition, although, if everything is taken into consideration, there is really no cause for complaint. Employment is much more general than is usual at this season of the year, but the large capacity for production makes it difficult to keep up with the procession, or to secure more remunerative prices. The feeling is very sanguine, however, in regard to the spring and summer trade, and manufacturers are not discounting the future in the matter of prices, although for strictly prompt deliveries of finished material, buyers can make favorable terms.

**PIG IRON.**—Prices are steady, and in spots there are indications of increased firmness, although as a rule buyers can get all they want at unchanged prices. There is no pressure to secure business however, so that the situation may be regarded as satisfactory from a sellers point of view.

**STEEL BILLETS.**—There is little or no change to report in this department, prices being just about as they were a week ago.

For February and March shipments about \$20.00 could be done, for later dates a full half dollar more is asked, with no disposition to consider bids at less money unless for favorable deliveries.

**FINISHED MATERIAL.** A good deal of inquiry is being made for ship and structural material and manufacturers are figuring on important additions being made to their orders before the end of the week.

Competition will be very close, however, and on this class of business, it is expected that the bids will be at low figures.

**OLD MATERIAL.**—The market shows no definite change, but there is a fair demand, and sales are not hard to make at quoted rates to those who need material.

#### Working Hard for the Prize.

The presentation of the nickel and gold plate lathe by the Davis & Egan Machine Tool Company (formerly the Lodge & Davis Company), to the most popular mechanical school in the United States, promises to be a very lively and interesting contest. Thousands of votes are coming in from all parts of the country. Several presidents of railroads have entered into the matter with a determination to win the prize for their favored schools and are placing large supplies of tickets in the hands of their agents with instructions to inaugurate a vigorous campaign. Students are going from door to door soliciting votes on long lists. One young man is credited with having turned in to his school a list on which were enrolled the names of over 5000 voters. A number of schools are soliciting votes through the daily newspapers, others are sending circular letters, and in fact every known means is being employed to encourage votes.

The company wish to advise all parties interested that the contest will close promptly on March 1st, 1896, at 12 o'clock.

C. M. Billingsley, of Washington, D. C. has entered the retail bicycle business. His store is located on Ninth Street, between H and I Streets.

# THE HARDWARE TRADE.

## CONDITIONS AT THE PRINCIPAL CENTERS.

### At St. Louis.

The hardware market at this point is in pretty much the same condition that it was a week ago. Shipments are no heavier and the general situation does not seem to have improved a great deal. However, the time of year is fast approaching when requirements will certainly assume larger proportions.

Reports from the country show that while dealers are figuring on spring trade being active, they are not inclined to discontinue the conservative policy which has hitherto characterized most of their buying. The orders now being placed corroborate this view of the matter. Except in a few instances, dealers wait almost until they get inquiries about the goods before ordering them.

Such a policy it must be said has its advantages as well as disadvantages. It not only enables the dealer to make more sure of his profits, but it also keeps his business in such shape that obligations can be met more promptly. In consequence, too, of so much reluctance about making purchases, stocks are low, though on the other hand many a desirable sale is lost simply because the goods were not in stock when wanted. Enough of this sort of business has already been transacted, it would seem, to teach the utter folly of ultra-conservatism. If a heavy demand should come now it would find a great many dealers napping—but the wholesale trade bases its hopes upon the conjecture that dealers will stock up before the revival puts in an appearance.

**NAILS.**—The demand for nails, while better than some weeks ago, is of less than seasonable proportions. Association prices are \$2.48½ car load lots St. Louis, for wire nails; cut nails, \$2.23.

St. Louis receipts of nails, in kegs—		1895.	1896.
For January	23,957	31,790	
For February, 20 days	15,200	25,060	
Totals	39,157	57,450	
St. Louis shipments of nails, in kegs—		1895.	1896.
For January	30,873	46,45	
For February, 20 days	23,914	22,085	
Totals	54,787	68,536	

**BARB WIRE.**—The moderate movement of barb wire heretofore reported continues. Competition is close, however, and prices not so steady as they might be. We quote \$1.60 and \$1.90, for painted and galvanized respectively, in car lots.

St. Louis receipts of barb wire, in pounds—		1895.	1896.
For January	1,060,300	1,101,300	
For February, 20 days	702,300	733,600	
Totals	1,762,600	1,834,900	
St. Louis shipments of barb wire, in pounds—		1895.	1896.
For January	4,285,430	4,094,900	
For February, 20 days	4,939,700	3,09,000	
Totals	9,225,130	7,185,900	

**TIN PLATE.**—Although improvement is noticeable, it is by no means marked.

American production continues to increase, and there seems to be much more effort expending in making plates than in making profits. A fair demand is expected for domestic roofing plates in a short time, as soon as building operations can be commenced. Contrary to expectation, the canning trade has bought little tin plate for future delivery. Stocks are increasing at the mills, and a number of plants are nearly out of the market, but are still producing. The dipping concerns are doing but little.

St. Louis receipts of tin plate, in boxes—		1895.	1896.
For January	6,480	6,957	
For February, 20 days	1,595	6,033	
Total	8,075	12,990	

**GLASS.**—February 22 is the day set for starting window glass factories. Stocks, especially staple sizes, are sold down low, and though they run at full capacity it will take the factories quite a while to turn out enough glass to refill broken stocks. Following are the quotations: Discounts on window glass, 70 & 10, f. o. b. St. Louis. Discounts on plate glass, 75 & 10, f. o. b. St. Louis.

**PAINTS AND COLORS.**—The movement of paints is slow and will not be likely to improve until bet-

ter weather sets in, so that building operations can be resumed. Mineral paints, dry, are quoted per pound as follows:

Cleveland Purple iron clad, kegs	1.02½
Lowe's Mineral, bbls.	54
Prince's Mineral, bbls.	91½

**PUTTY.**—Little is being done in putty, for much the same reason that the demand for paints is quiet.

	St. Louis.	Pittsburg.
In bulk	\$2.00	\$1.50
In 25 pound cans	2.55	2.00
In buckets	2.25	1.75
In 50 pound cans	2.40	1.90
In 12½ pound cans	2.85	2.15
In bladders	2.25	1.75
Turpentine, per gallon, in barrels, 33c.		

**OILS.**—The market is without any new features. We quote coal oil, gasoline and naphtha in barrels subject to market changes as follows, f. o. b. St. Louis and East St. Louis:

P W 150 deg. Oil, at	10c	W W 150 deg. Oil, at	10½c
H. L. 175	12c	Deo Naphtha	10½c
Deo Stove Gasoline	12	Redistilled Gasoline	87½ 17
W. Va. Summer Lub'g.	12c	W. Va. Nat. 29° Lub'g.	21c
Cylinder, No. 1	40c	Cylinder, No. 2	32c
Castor Oil, machine	24c	Engine, No. 1	24c
Boiled Linseed oil 4½ in bbls.		Raw Linseed oil 38c in bbls.	
Amber engine oil	15c	Cotton seed oil, white	40c

**BINDER TWINE AND ROPE.**—While rope is in fair request, shipments of twine continue light.

White Sisal	6c	Manila	6½c
Standard Sisal	6¼c	Pure Manila	7¼c
St. Louis receipts of cordage and rope, in coils—			
	1895.		1896.
For January	7355		20,297
For February, 20 days	4145		15,280
Total	11,500		35,577

**FIRE ARMS AND AMMUNITION.**—Demand continues moderately active, with prices firm and unchanged.

SHOT.		1895.	1896.
Patent, per bag	\$1 20	Dust, per bag	1 80
New York chilled	1 50	Buck	1 45
2-0, 3-0, 3-B, 2-B, 1-B, chilled, per bag			1 45
In 80-bag lots no charge for drayage; 2 per cent off for cash in 10 days			

**WHITE LEAD.**—The demand is of seasonably large proportions.

We append the quotations made by the local branch of the National Lead Company, which are subject to change without notice:

Strictly pure white lead, dry white lead, red lead or litharge, in kegs, in lots of less than 500 lbs.	54½
In lots of 500 lbs. and over.	54c
Red lead and litharge, in bbls. and half bbls.	4c per lb. less than price in kegs.
Dry white lead, in bbls.	54c
Strictly pure lead, in 25-lb. tin pails, ¼c; in 12½-lb. tin pails 1c, and in 1 to 5 lb. tin cans (100 lbs. in case), 1¼c per lb. over keg price.	
Terms—On lots of 500 lbs. or over, 60 days, or 2 per cent discount for cash if paid within 15 days from date of invoice.	

### At Pittsburg.

Pittsburg, Feb. 20, 1896.

There is nothing especially new in the hardware market. It is expected that the increasing cost of raw materials in some lines will make higher prices necessary. Wire nails are still quoted at \$2.25 for car load lots, \$2.35 for smaller quantities. Cut nails range from \$2.05 to \$2.15. Barb wire painted is \$1.90 per 100 pounds; galvanized, \$2.20 in car load lots. Shelf goods are moving pretty fairly.

### At New York.

New York, Feb. 18, 1896.

Trade has been fair though by no means heavy. The general outlook, however, for spring trade is regarded as favorable. At present no one seems anxious to stock up heavily, and in many instances where there has been a general depletion of goods it needs but a spurt of trade to start a crowd of orders. An impulse of this kind would wake up considerable demand that at present is in its night cap. All things considered, the best judges of the situation consider matters hopeful. Nails are in fair demand, and as the building season opens this is likely to show a satisfactory increase. Wire nails are quoted at \$2.43 for car load lots on dock, and



\$2.53 for small lots from store. Cut nails move at \$2.18, car load lots on dock, and \$2.30 small lots from store.

### At Chicago.

Chicago, Feb. 18, 1896.

There is every prospect of a good spring business, though trade in a general way has been quiet during the past week. The weather has without doubt had a bad effect on trade. Bad roads in the rural districts and in fact on all highways leading to the smaller cities and towns have hindered business otherwise certain. This has its reflex more or less in all centers of distribution. Mud, however, is made to dry, and bad roads are but a temporary obstruction. Orders are reported as encouraging, and the general feeling is one of confidence. There is some discontent as to collections, however, in which there is considerable elbow-room for improvement. Wire nails show a betterment of trade with manufacturers and jobbers. Buyers are placing orders freely in anticipation of an advance expected on March 1. Present prices \$2.42 base, Chicago, for factory lots, small lots \$2.45@2.50. Steel cut nails are in better demand. Mill lots \$2.17 base and \$2.20@2.25 in smaller quantities from warehouse. Barb wire shows increased activity, with jobbers making concessions on mixed car loads; prices held by these are \$1.65 for painted and \$1.95 for galvanized. Small lots are moving at \$1.80 for painted and \$2.10@2.15 for galvanized.

### At Denver, Col.

Denver, Col., Feb. 7th, 1896.

The volume of our hardware trade as compared with past two years, shows an increase of a considerable percentage, indicating renewed prosperity in our section. Nor is it any particular line, unless we except prospectors supplies, in which the demand has been very active all winter. We believe the outlook for spring trade was never better and anticipate a banner year for 1896.

Stimulated by the low prices prevailing at the mills in the spring of 1895, and a demoralization of freight rates existing at about the same time, plentiful stocks of nails and wire were shipped into this territory, which are not yet exhausted. What the spring demand for these goods may be, we are unable to prophesy, but presume they will keep pace with other goods. Owing to the general feeling that the present market price of nails is rather high in comparison with that of raw material, we anticipate that the demand will be only for immediate requirements. Collections are fairly good and rather above the average.

In a general way we may say that local conditions are such in Colorado as to lead us to believe that 1896 will be an exceptionally prosperous year in this locality. The developments in mining at Cripple Creek and other districts have been of such a nature as to attract the attention of the country at large, and an unusual influx of capital and people is following as a natural consequence.

THE GEORGE FRITCH HARDWARE CO.

### Hardware Conditions in the South.

Reports from various sections of the South express a confidence in the betterment of trade during the present year. Conditions are favorable for this growth of business. Enterprises are in progress everywhere. New industries are being started, and those that lagged somewhat under the recent adverse conditions of general business are showing signs of revived activity. The influx of population from the North and West is making itself felt in an increasing demand for shelf and builders hardware. The farmer is now in evidence on lands long untouched with plough share or hoe. As a rule the new comer wants implements of the best and most approved kind, and as this spirit of progress and improvement permeates the entire country, the outlook is certainly promising. Where crops have been good and prices fair and the rural husbandman is less dependent on the country merchant for extended credit till his produce is marketed, he has more cash at his disposal, and is not likely to let it rust in making improvements in his surroundings and in supplying his long felt needs. Exceptions of course are not wanted to the rule. Produce in some sections suffers from low prices, and has been limited by adverse climatic conditions. The tide of

prosperity is never uniform in its rise. It has its shoals and obstructions, and spots are unreached by even a generous flow of reviving business, but in a broad and general sense there is no question as to a well-defined betterment. Reports vary as to its degree. Some are warm with hope, some are chilly with doubt. Each from its own standpoint is not without reason. There are but few, however, who doubt that the horizon is clearing, though opinions may differ widely as to when the clock will strike the hour.

There is no doubt but that a more or less unsettled condition of the metal markets has handicapped the hardware business. Unsteady values are bad for business. Dealers hesitate in stocking up and buyers are naturally prone to keep their orders in salt, in hope of falling prices. These things, however, eventually right themselves as business settles down to a revised basis of values. All disturbances of this nature are but incidents, facts that drop out of the procession as it moves along.

The bicycle trade is making itself felt as a valuable auxiliary to the hardware business. It is likely to continue so, and as the most favorable seasons of the year are coming for bicycle travel, the outlook has a silver lining. In some localities, however, complaints are being made as to dealers rushing matters too freely, and assuming obligations through over-stocking that compel sales at less than a legitimate profit. Over-doing is a national vice.

The present nail card is giving rise to some strong expressions of dissent. It is pronounced unsatisfactory both to dealers and would-be consumers. What results this disapproval may have on the continuance of the present system it is hard to say. The manufacturers hold the key to the position, and they may or may not decide as to any change. The matter, however, is being widely discussed and is not likely to be laid to rest till its merits or demerits are intelligently decided.

### Special Retail Hardware Notes.

Kersch & Brucks, Canal Dover, O., are succeeded by Kersch & Schneider.

A. C. Martin, Clyde, O., has made an assignment.

F. J. Young, Saranac, Mich., has sold out.

F. W. Maxted, Racine, Wis., has made an assignment.

Kennedy & Scholes, Fairport, Mo., are succeeded by Kennedy & Sherard.

E. S. Hill succeeds the Indianola Hardware, Implement and Furniture Company, at Indianola, Neb.

Martin Neissen, Kennard, Neb., is succeeded by L. E. Ward.

Fowler & Morrison, Salem, Mass., are succeeded by Fowler & Deland.

Goodale & Higgins, stove manufacturers, Piqua, O., have made an assignment.

Washburne & Rudolph, Milford, Kas., have been succeeded by J. Rudolph & Son.

Murray & Hamm, Boone, Ia., have dissolved.

Chas. Lyman, Clarinda, Ia., has made an assignment.

Mink & Glidden, Galva, Ill., have dissolved.

Thos. S. Johnson, Portland, Ind., has sold out.

Hamilton & Russell, of Champaign, Ill., have dissolved.

H. L. Dyer has opened a new hardware store at Richmond, Tex.

The name of the Taylor Hardware Company, Taylor, Tex., has been changed to the Blaipe-Trewett Hardware Company, and the capital increased from \$25,000 to \$50,000.

The C. A. Brusle Hardware Company, Plaquemine, La., will increase their capital stock to \$25,000, all paid in.

George C. Faulkner's store and stock, at Mt. Pleasant, Ia., was burned; loss, \$5000.

The Western Hardware Company building, Salt Lake City, Utah, was slightly damaged by fire.

Hall & Smith, Russellville, Ark., have been succeeded by C. P. Hall.

The W. A. Kehnest Hardware Company, of Del-

ance, O., has become an incorporated concern. W. A. Kehnest will be the manager.

John W. Jochin, of Ishpeming, and several Marquette associates, are to open up a general hardware store at Marquette, Mich.

Whattley & Spell, Atlanta, Tex., have dissolved partnership. T. S. Spell will continue the business. Brackner & Windham, Italy, Tex., have been succeeded by Bracken & Moore.

### The Tin Plate Situation.

Tin and Terne: The American tin-plate trade has not as yet shown any marked signs of improving from the condition of apathy and low prices in which it has been plunged for some time past. Influences which with any other industry would have effected marked improvement have had little if any effect upon it, while any impression that was made has been counteracted by other influences in the opposite direction.

The domestic tin plate manufacturers now fully realize that there are other enemies to their success than foreign competition and high raw material cost. These are bad enough, and it is not our desire to cry down their harmful effect on domestic trade. But the history of the market for the past few months has shown conclusively that prices for domestic plates can rule far below the rates at which similar foreign plates are sold, and this in the face of heavy importations, the American production in 1895 having been only say three-fifths as great as the importations, or about three-eighths of the total production and imports. The authority for this statement was given in an article in our last issue. In these circumstances the outlook is very poor for the time when all our present plants built and building will be in full operation, for there is no doubt that our production will ultimately at least equal the home demand.

Realizing that some at least of the evils affecting their trade were in their midst, and ought to be under their control, those of the tin plate manufacturers who belong to the organization took up the matter some time ago, and have lately busied themselves more than formerly with the problem and its solution. A meeting of the association, held some two weeks ago, seems to have been quite generally misunderstood, and the transactions at that meeting have been very erroneously reported. If the imagination which fathered these reports had been tempered with a little reason, the results would have been different. Any one at all intimate with the personality of those engaged in the American tin plate industry should know that the contemplated trust with which they are charged is out of the question. The Steel Sheet Manufacturers' Association, an organization cognate with that of the tin plate makers, but a much stronger one, with a better understanding of their trade conditions, and no foreign competition, have failed in great measure to regulate prices, and have not seriously contemplated the formation of a trust, though the chances of success in organizing such a trust would be much greater than in the case of the tin plate makers.

What is really contemplated by the Tinned Plate Manufacturers' Association may be best styled a bureau of information. It is held, quite properly, that many of the low price sales that have been made have been due to a lack of knowledge on the part of the seller as to what his competitors were doing, and to the buyer playing the one against the other. Some time ago a price committee was appointed by the association, and in the hands of this committee lies the duty of formulating the details of a plan whereby the actual selling prices of each manufacturer will be collected, in order that all may know exactly what the market is, and that admonishment may be given to any manufacturer whose sales fall especially below the average. The honor of each manufacturer will be depended upon that the returns shall be accurate, and this should be sufficient assurance. The end to be attained is that American tin plate shall sell at as high a price as the foreign plate brings in the same market. In theory, the plan seems to meet the requirements of the case. Its success in practice will depend largely on the personality of those in the industry.

The Woodworth & Reed Mfg. Co., of Chicago, Ill., has been incorporated for \$50,000 by J. H. Rollins, F. Crewe, F. R. Reed and others. The company will manufacture bicycle supplies.



## St. Louis Prices and Discounts for Heavy Hardware and Metals

## Iron and Nails.

Usual concessions on cut and loads.

## Common Iron—

\$1.50 rates.

## Refined Iron—

Norway iron—3½¢ card

## Horse and Mule Shoes—

Horse shoes, all sizes, 35¢

Mule shoes, all sizes, 35¢

## Crowbars—

Per lb.

Wedge point, ordinary sizes, iron, steel pointed, 34¢

Wedge point, ordinary sizes, iron, steel pointed, extra finish, 34¢

Wedge point, ordinary sizes, solid steel, 34¢

Pinch point, same prices as above.

## Wire Nail Card—

National Wire Nail Card (in kegs), adopted July 19, 1895.

## COMMON FENCE, SHINGLE, TOBACCO, FLOORING AND COMMON BRASS—

Advance over basing rate.

10d to 60d, 50¢ 4d & 6d, 30¢ 30

6d & 7d, 60¢ 3d, 30¢ 30

6d & 7d, 60¢ 3d, 30¢ 30

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## Sheet and Galvanized Iron.

No.	Common.	Wood's.	Soft.
16	22	22	22
18	22	22	22
20	22	22	22
22	22	22	22
24	22	22	22
26	22	22	22
28	22	22	22
30	22	22	22

## GENUINE RUSSIA IRON—

Perfect—Nos. 9, 10, per lb. 11c

Tare, 2 lbs to b'dle. For less than b'dle, add 1¢ per pound.

## PATENT PLANISHED IRON—

Nos. 26 & 27, A quality, per lb. 10½¢

Large quantities at proportionate discounts.

## GALVANIZED SHEET IRON—

Gauge. Wt. per sq. ft. Per lb.

No. 10 22 22 22

No. 12 22 22 22

No. 14 22 22 22

No. 16 22 22 22

No. 18 22 22 22

No. 20 22 22 22

No. 22 22 22 22

No. 24 22 22 22

No. 26 22 22 22

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No. 114 22 22 22

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No. 120 22 22 22

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No. 124 22 22 22

No. 126 22 22 22

No. 128 22 22 22

No. 130 22 22 22

No. 132 22 22 22

No. 134 22 22 22

## Brass Tubing.

Iron Pipe sizes:	Brass Pipe sizes:
1 inch—22 22 22	1 inch—22 22 22
1½ inch—22 22 22	1½ inch—22 22 22
2 inch—22 22 22	2 inch—22 22 22
2½ inch—22 22 22	2½ inch—22 22 22
3 inch—22 22 22	3 inch—22 22 22
3½ inch—22 22 22	3½ inch—22 22 22
4 inch—22 22 22	4 inch—22 22 22
4½ inch—22 22 22	4½ inch—22 22 22
5 inch—22 22 22	5 inch—22 22 22
5½ inch—22 22 22	5½ inch—22 22 22
6 inch—22 22 22	6 inch—22 22 22
6½ inch—22 22 22	6½ inch—22 22 22
7 inch—22 22 22	7 inch—22 22 22
7½ inch—22 22 22	7½ inch—22 22 22
8 inch—22 22 22	8 inch—22 22 22
8½ inch—22 22 22	8½ inch—22 22 22
9 inch—22 22 22	9 inch—22 22 22
9½ inch—22 22 22	9½ inch—22 22 22
10 inch—22 22 22	10 inch—22 22 22
10½ inch—22 22 22	10½ inch—22 22 22
11 inch—22 22 22	11 inch—22 22 22
11½ inch—22 22 22	11½ inch—22 22 22
12 inch—22 22 22	12 inch—22 22 22
12½ inch—22 22 22	12½ inch—22 22 22
13 inch—22 22 22	13 inch—22 22 22
13½ inch—22 22 22	13½ inch—22 22 22
14 inch—22 22 22	14 inch—22 22 22
14½ inch—22 22 22	14½ inch—22 22 22
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20 inch—22 22 22	20 inch—22 22 22
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28½ inch—22 22 22	28½ inch—22 22 22
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30 inch—22 22 22	30 inch—22 22 22
30½ inch—22 22 22	30½ inch—22 22 22
31 inch—22 22 22	31 inch—22 22 22
31½ inch—22 22 22	31½ inch—22 22 22
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37 inch—22 22 22	37 inch—22 22 22
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40 inch—22 22 22	40 inch—22 22 22
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42½ inch—22 22 22	42½ inch—22 22 22
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43½ inch—22 22 22	43½ inch—22 22 22
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44½ inch—22 22 22	44½ inch—22 22 22
45 inch—22 22 22	45 inch—22 22 22
45½ inch—22 22 22	45½ inch—22 22 22
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49½ inch—22 22 22	49½ inch—22 22 22
50 inch—22 22 22	50 inch—22 22 22



## Chisels—

SHOVEL, FRAMING AND FIRMER  
P. S. & W. 75.00/100  
Wetherby Dis. 75.00/100  
Merrill 100.00/100  
O. H. Tool Co. 100.00/100  
Buck Bros. 100.00/100  
L. & J. White 20.00/20  
Douglas 75.00/100

TANGLED AND MISCELLANEOUS  
Tangled firmers 50.00/50  
Butcher's 50.00/50  
Spear & Jackson 5.00/50  
Charles Buck 5.00/50  
Cold chisels, 2 lb. 10.00/10

Chucks— Each. Dis.  
Beach patent 50.00/20  
Morse's adjustable 7.00/20  
Danbury 6.00/20  
Syracuse, Balz patent 30.00/20

Clamps— Dis.  
Adjustable, Cincinnati 25.00/20  
Hammer's 15.00/10  
Stearns 30.00/30  
Carriage makers, Sargent's 10.00/10  
Eberhard Mfg. Co. 40.00/10  
Warner's 10.00/10  
Barnes' machinists' 15.00/10  
Sargent's 15.00/10  
Carpenter's, Cincinnati 25.00/10

Chisels, Butcher's— Dis.  
New Haven Edge Tool Co.'s 10.00/10  
Beatty's 10.00/10  
L. & J. White 25.00/20

Corkscrews— Dis.  
Humason & Beckley Mfg. Co. 10.00/10  
Williamson's 30.00/30  
Detroit Cork Screw Co.'s 30.00/30  
Hove Bros. & Hubbert 30.00/30  
Sanson 30.00/30

Corn Knives and Cutters—  
Bradley's Dis. 10  
Wadsworth's 25.00/25  
Cradles— Dis.  
Grain 60.00/60

Curry Combs— Dis.  
Pitcher's 10.00/10  
Rubber, 2 doz. 37.50/20  
Gibb's magnetic, per doz 30.00/20

Drawing Knives— Dis.  
Wetherby P. & S. W. 75.00/100  
Merrill 100.00/100  
Watrous 15.00/10  
Bradley's 35.00/35  
Adjustable handle 25.00/25  
Wilkinson's folding 25.00/25

Drills and Drill Stocks—  
Blacksmith's, each 10.00/10  
Self-feeding, each 10.00/10  
Brent, P. & S. W. 40.00/10  
Wilson's 20.00/20  
Miller's Patent, each 30.00/30  
Ratchet, Merrill's 20.00/20  
Ingersoll's 20.00/20  
Parker's 20.00/20  
Whitney 20.00/20  
Weston's 20.00/20  
Moore's triple action 20.00/20  
Bench drills, Stearns 20.00/20  
Automatic boring tools, each \$1.75/1.85

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Diamond, W. & H. 50.00/50  
Graham's patent grooved shank 50.00/50  
Morse 50.00/50  
Standard 50.00/50  
Syracuse (metal list) 50.00/50  
Cleveland 50.00/50  
Williams 50.00/50

Door Hangers— Dis.  
Cronk's pat. steel covered 60.00/60  
Duplex (wood track) 60.00/60  
Interstate 50.00/50  
Kiddie's 50.00/50  
Lane's parlor 40.00/10  
Lundy steel parlor 40.00/10  
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Magic 60.00/60  
Matchless 60.00/60  
Moody 60.00/60  
Moore's baggage car door 30.00/30  
Moore's elevator 30.00/30  
Moore's railroad 30.00/30  
Paragon parlor, per set 30.00/30  
Pendulum, Payson's No. 533 30.00/30  
Pilot 30.00/30  
Richards' improved 30.00/30  
Sterling 30.00/30  
Star Steel 50.00/50  
Stearns' Challenge 50.00/50  
Terry's ideal 60.00/60  
Wetherby's patent 20.00/20  
Wm. West 30.00/30  
Zenith, for wood track 60.00/60

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Warner's 50.00/50  
Phonix 50.00/50  
Rubber, complete, per doz. 30.00/30  
Star (coil), list number 1809 30.00/30  
Torrey's rod, 30 inch, 2 doz. 30.00/30  
Victor (coil) 50.00/50  
CARRIAGE, WAGON, ETC.  
Elliptic, Concord, platform, and half scroll, 60.00/60  
10x10 or net price 30.00/30  
Chiff's bolster springs 30.00/30

Escutcheon Pins— Dis.  
Brass 60.00/60  
Iron, list Jan., 1890 80.00/80

Faucets and Gas Gates—  
Faucets: Dis.  
Ward's lock open & shut key 50.00/50  
Burnsides red cedar 50.00/50  
Cork lined 50.00/50  
Self-measuring, per doz 30.00/30  
Molasses Gates: Dis.  
Steebline 80.00/80  
Stearns 30.00/30  
Enterprise 30.00/30  
Lincoln's 30.00/30  
Weed's 30.00/30

Files— Dis.  
Best brands 60.00/60  
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Stubs imported, Stubs list 25.00/20

Forks—  
Hay, Assn. List 75.00/75  
Manure, 4 line 75.00/75  
Manure, 5 and 6 line 75.00/75  
Spading Forks, Manure and Victor Hay, Manure and Header 75.00/75  
Header 75.00/75  
Columbian Socket Hay, Manure and Spading 75.00/75

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Shepard's 1, 2 and 3 60.00/60  
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Gauges— Dis.  
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Stearns' surface, center and stretch 25.00/25

Gimlets—  
Nail and spike 60.00/60  
Gimlets 60.00/60  
Double cut, Shepardson 60.00/60  
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Dixon's Evertasting, in box 30.00/30  
Dixon's Evertasting, 10 lbs. 30.00/30  
English Coach, 5 lb. tin 30.00/30

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Family 50.00/50  
New York Pattern 50.00/50  
Oiler Pattern 10.00/10  
Millers Falls 25.00/25

Grindstone Fixtures— Dis.  
Howard Stone 20.00/20  
Sargent's Patent 70.00/70  
P. S. & W. Co. 50.00/50  
Moore's 50.00/50  
Russell & Erwin 50.00/50

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Dixon's Evertasting 10.00/10  
pails, each 10.00/10  
Dixon's Evertasting, in box 30.00/30  
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Fraser's, tubs 30.00/30  
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Clothes line, Moore's 70.00/70  
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*D. J. Mallett*

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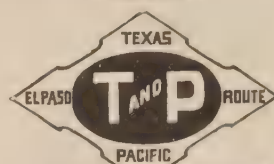
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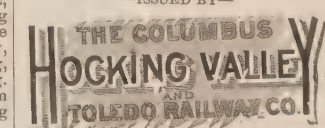
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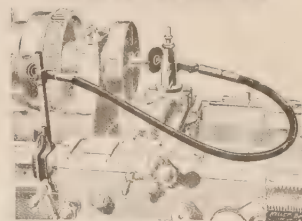
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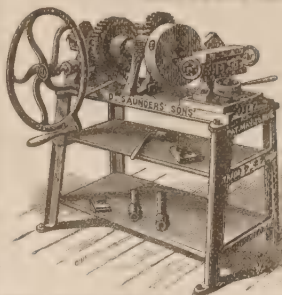
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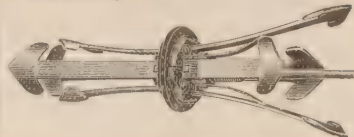
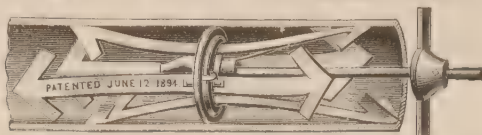
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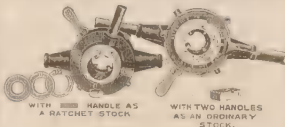
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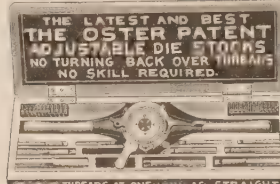
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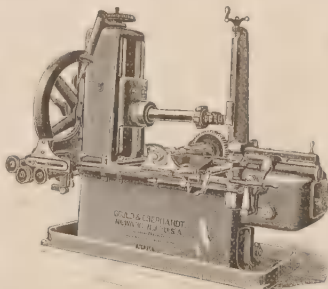
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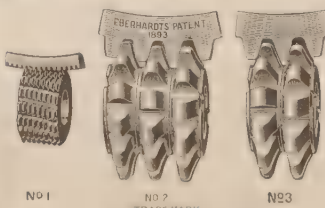
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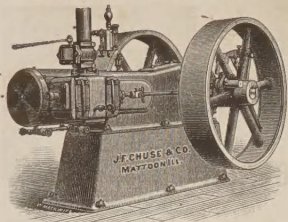
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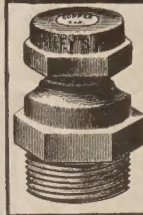
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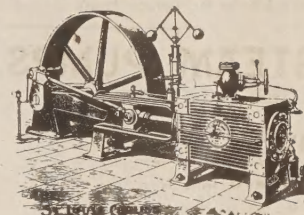


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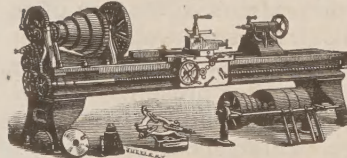
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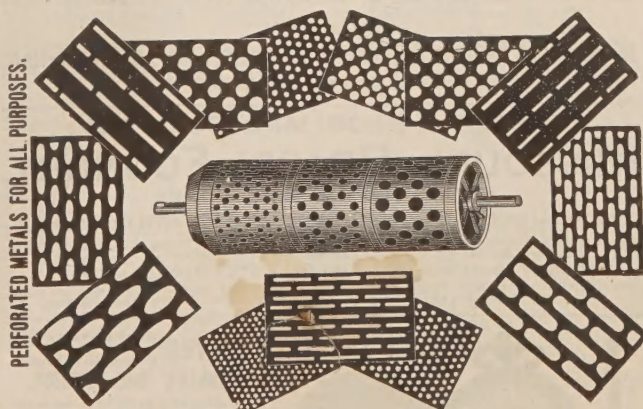
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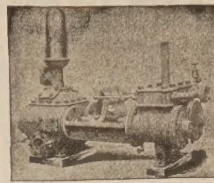
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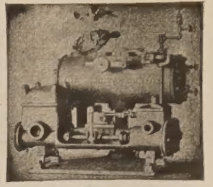
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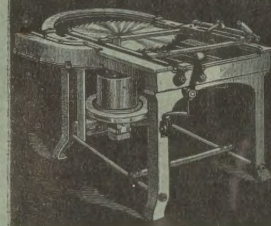
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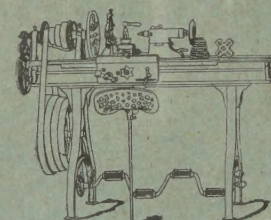
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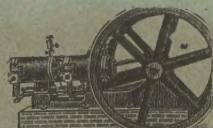
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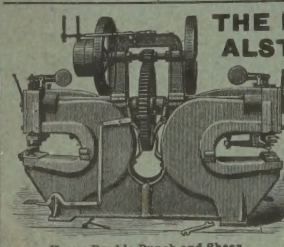


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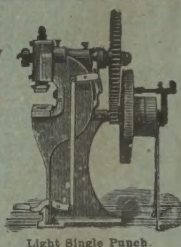
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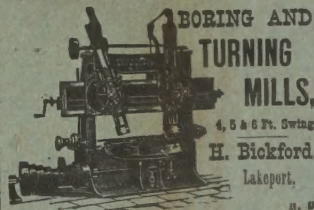
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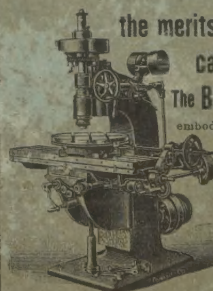


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